

COMPUTERWORLD

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Burroughs moves to defray Sperry cost with sale of aerospace group. Page 114.

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Professional associations share budget pinch of revenue shortfall from National Computer Conference. Page 2.

DEC's Vaxmate is scheduled to arrive this Thursday. The personal computer will network with VAX and Microvax computers through Ethernet. Various configurations are expected.

Compaq Computer, meanwhile, has selected Sept. 9 for the introduction of its Intel 80386-based personal computer running at 12 MHz.

AT&T so far received the vote of 75% of U.S. households in nationwide balloting to select long-distance carriers, the telecommunications giant said. As of this week, 70% of all households were to have completed the selection process. The National Telecommunications Information Agency, a division of the Department of Commerce, said AT&T's 1985 share of the entire long-distance market was 81%.

Speculation is rampant among dealers and analysts that IBM will announce a new 80386 machine to replace the Personal Computer XT this year, and some predict the unveiling to come this week. The machine will sell for \$3,995 with a 20M-byte hard disk drive and \$2,700

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NEWS

Lean NCC hurts sponsors

AFIPS feels pinch; others' cuts scattered

By David A. Lutkin

The unexpectedly lean turnout for this year's National Computer Conference (NCC '86) has crimped the budgets of the four professional associations that split a one-half interest in the show.

The groups have also suffered other shortfalls in projected revenues for current or recently ended fiscal years due to the slowdown in the computer industry.

NCC is half-owned by the American Federation of Information Processing Societies (AFIPS), which has scaled back activities and contributions to other groups due to the decline in attendance at the show [CW, Aug. 18].

The remaining ownership of NCC is divided among the Association for Computing Machinery (ACM), the Data Processing Management Association (DPMA) and the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE-CS), which each hold a 15% share, and the Society for Computer Simulation (SCS), which owns 5%.

Unlike AFIPS, which has entirely eliminated contributions to the "Computer Chronicles" television show, the Boston Computer Museum and the Charles Babidge Institute, the other four NCC sponsors are making only scattered, marginal reductions in outlays for activities.

The IEEE-CS has cut back its roughly \$13 million budget by about \$1.5 million, to lower-than-expected NCC revenues and other declines in revenue, said Executive Director T. Michael Elliott.

He said the IEEE-CS does not have a firm figure yet for its proceeds from NCC. "The AFIPS people are trying to close the books on it now,"

Elliott explained.

The downturn in the computer industry is also reflected in reduced participation in society events and less advertising and subscription growth for its publications, he added.

The IEEE-CS is cutting back on some of its tutorial programs, reducing the number of pages in the six magazines it publishes and doing "a general belt-tightening throughout the organization," Elliott claimed.

The ACM, whose current annual budget is about \$16.5 million, estimates it will take in about \$350,000 from NCC and other contributions from AFIPS, rather than the projected \$850,000, according to President Paul Abraham.

Incurred other shortfalls in revenue from the computer industry slowdown, ACM's revenue may be off by about \$1.5 million, Abraham said.

The ACM is making scattered cuts in its budget, forcing some committee to become self-supporting, he said. The group hopes to narrow the gap by raising annual dues from \$50 to \$65.

Abraham noted that ACM's special interest groups, which operate under a separate budget, are doing better than usual.

The DPMA has reduced the number of pages in publications and cut down on fanfare at gatherings, but its lagging NCC revenue is "not a significant number in terms of our operating budget," said Executive Director John Venato.

"Our members will see little difference," he claimed.

The SCS took in \$280,000 less than projected from NCC in the year beginning July 1, or approximately a third of the budget, Executive Director Charles Pratt said.

An editor and a graphic designer left SCS have not been replaced, and the group has raised membership dues, prices of publications and fees for other conferences, he said.

North Carolina hackers draw indictments for fraud

By James A. Martin

CHARLOTTE, N.C. — Five North Carolina men have been indicted on computer fraud charges, including unauthorized use of long-distance telephone access codes as a result of a U.S. Secret Service investigation into an underground network of hackers who allegedly exchanged illegal information over Atari computer microcomputers.

The network of hackers has tentacles reaching all across the country to the West Coast," said William Williamson, the agent in charge of the Secret Service office in Charlotte.

The continuing investigation began in January when a Raleigh, N.C., long-distance telephone company, Telemarketing Communications (TMC), reported it had lost an estimated \$100,000 to unauthorized calls within six months. Unauthorized long-distance calls lasting up to three hours were made at the telephone company's expense, Williamson said. Approximately 21 long-distance car-

riers such as TMC lost revenues as a result of the hackers.

The five men, ages 23 to 40, live in separate North Carolina cities, and all allegedly used Atari microcomputers and computer modems to access extranet bulletin boards. The bulletin boards provide users with a variety of illegal information, Williamson said, including unauthorized long-distance and credit card codes and instructions on how to construct explosive devices.

Three of the men were indicted by a federal grand jury in Greensboro, N.C., the other two by a grand jury in Raleigh. The charges include devising a method for defrauding TMC and copyright infringements concerning Atari computer games.

An arraignment is scheduled Tuesday in Greensboro federal court for Robert E. Lee II, Tyrone Bullins and Michael McCann. Ralph Sammie Fig and James McPhail are scheduled to answer charges Oct. 6 in Wilmington, N.C., federal court.

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BY ALAN WITSCHONKE



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NEWS

Symphony upgrade converts Dbase III files

Adds regression analysis, matrix manipulation

By Douglass Barney

CAMBRIDGE, Mass. — Lotus Development Corp. last week announced Symphony Release 1.2, a version of its integrated package that can convert files from Ashton-Tate's Dbase III data base software and that offers linear regression analysis.

The enhancements included in Symphony Release 1.2 are aimed at obtaining "spreadsheet parity" with Lotus 1-2-3 Release 2.01, according to Paula Berman, Symphony product marketing manager for Lotus. Like 1-

2-3, Symphony and its copy protection can now be installed on hard disks, and users do not need a "key disk" to load the product.

Although Symphony has the same spreadsheet functionality as 1-2-3, the two products are not completely compatible. "The two spreadsheets are 100% compatible because they have different menu structures," Berman said.

In addition to regression analysis, Symphony now has matrix manipulation, a function used in statistical applications that allows multiplication and inversion across matrices of numbers.

Symphony also has controlled range input, which allows specific

spreadsheet cells to be designated to receive input.

Successful product

Despite industry criticism, Lotus considers Symphony to be a successful product but declined to provide sales figures.

Berman admitted, however, that it was not as successful as the firm expected. "When we initially shipped Symphony, we actually thought it was going to replace 1-2-3," she maintained.

Registered users of Symphony Release 1.0 or Release 1.01 can upgrade for \$75, and Symphony Release 1.1 users can upgrade free of charge, according to Lotus.

Multiuser arena braces for 386

From page 1

erial Corp.

In general, such multiuser systems will carry price tags in the \$6,000 to \$30,000 range. The systems will compete against Motorola's Inc. MC68000-based supermicros and departmental processors like IBM's System/36.

On a price-per-user basis, the prices of these machines should compare favorably with the early single-user systems, such as the Compaq Computer Corp. 80386-based personal computer, which is expected to range in price between \$7,500 and \$11,700, and Corvus Systems, Inc.'s \$12,795 Series 386 workstation.

Some observers, like William Welty, an analyst with Hambrecht & Quist in San Francisco, refer to the coming 80386-based multiuser systems as "VAX killers." The reasoning is that, faced with a \$60,000 per million instructions per second (MIPS) cost for a traditional supermicrocomputer like Digital Equipment Corp.'s VAX vs. 16,000 per MIPS for a similarly configured 80386-based system with comparable throughput, many users will opt for the better price, performance deal.

Most of the 80386-based machines will run Unix and have the added advantage of running the huge base of existing Microsoft Corp. MS-DOS ap-

plications. This would give the systems an edge over not only VAX-class machines but also over multiuser supermicros based on Motorola's 32-bit 68020 processor, Welty says.

Welty expects the Intel chip to supplant Motorola's 68000 microprocessor family as the chip of choice in the 32-bit microprocessor market. While Dataquest's projections are not quite as dramatic, they still indicate a significant change is about to take place in the 32-bit microprocessor market. According to the San Jose, Calif., market research firm, Motorola controlled 60% of the 32-bit microprocessor shipments in 1985, with National Semiconductor Corp. holding a 35% share. But by the end of 1986, Intel will have shipped a 30% share of the chips, with Motorola slipping to 57% and National Semiconductor falling to 10%.

Some will not switch

Despite these predictions, several vendors of systems using the Motorola chips say they will not switch microprocessors. "We have absolutely no plans of going to the 80386," states John Glade, engineering vice-president at Alpha Microsystems, Inc. Redesigning the firm's systems for a new microprocessor would be too costly, and Motorola has so far indicated no price migration path within its family, he says. Motorola recently raised the top speed of the 68020 from 20 MHz to 25 MHz and is known to be designing a competitive 68030 or 68040 chip, which may bring a mem-

ory management unit on-board.

Further, Motorola has been delivering the 68020 for the past 12 months, adds Don Morrison, product manager at Fortune Systems Corp.

"Intel is playing catch-up," he says.

For multiuser business environments in the U.S., Intel's 80386 chip will have the biggest impact on small departmental systems, serving 11 to 20 users, Dataquest analyst Elizabeth Levy says. In this category, 80386-based systems will go up against the likes of DEC's Microvax II, DG's MV4000 and IBM's System/36.

This category is precisely Altos's bread and butter, says Jeff Bork, product marketing manager. While Altos supplies OEMs with a 68020-based machine, its primary business is selling Intel-based systems to value-added resellers and dealers. Altos currently offers an 80286-based system that Bork says can host 30 users. Altos' 60-user, 80386-based machine, due out in the first half of 1987, will range in price to above \$40,000, Bork says.

The 68020 and 80386 differ in terms of technical specifications, but most observers say the only significant difference is the 80386's ability to run MS-DOS. Although Welty, Levy and many other observers stress the importance of the 80386 chip's ability to support MS-DOS along with other operating systems, the new Altos system will not be designed for MS-DOS, Bork says. In a multiuser environment, the demand for MS-DOS applications is not really very large, Bork claims.

Microsoft Chairman Bill Gates agrees that his company's personal computer operating system should remain on personal computers. "Having everybody on a shared processor can lead to unpredictable performance," Gates recently told Computerworld [CW, Aug. 18].

Given this conflict, Bork and others say diskless PC terminals will gain popularity by integrating MS-DOS on multiuser systems.

While new systems from Altos and other companies may compete against minis, large minicomputer vendors like DEC are not about to stand still. "Digital Equipment will be doing a lot at the low end as well as the high end of their product line," Levy says. "They have a lead in terms of market visibility, image and installed base over a lot of small companies that might be bringing out 386-based systems."

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NEWS

Aldus tunes publishing program for business use with discounts, support

IBM PC version seeks market beyond Apple

By Peggy Watt

SEATTLE — Aldus Corp. will court the corporate market with volume purchase and technical-support programs that will accompany release of the IBM Personal Computer version of its desktop publishing program Page Maker, to be announced this week.

Companies will also be able to obtain the discount price on joint purchases of the two versions of Page Maker that are on the IBM Personal Computer, AT and compatible systems and the 1-year-old Page Maker version that runs on Apple Computer Inc.'s Macintosh.

Executives of Aldus last week declined to specify the discount structure. They said details will be announced when the PC version ships, before the end of this year. It is expected that volume discounts will be applicable to purchases of more than 100 copies.

Also scheduled for the fall are several optional training packages and the Page Maker Portfolio, a series of templates sold separately for less than \$100 that offer standard designs for common office forms, newsletters, memos and brochures.

The PC version of Page Maker will emulate the Macintosh's graphical interface by running only under the Microsoft Corp. Windows operating environment. For the first 90 days of shipment, the PC version of Page Maker will include a copy of Windows as a joint promotion with Microsoft, according to Aldus President Paul Brainerd. This version will also

offer a run-time version of Windows for users who do not want the graphical interface.

Also, the PC and \$495 Macintosh versions of Page Maker will be able to read each other's files directly, largely because 80% of the core code is the same for both versions, said Jeremy Jaech, engineering manager.

Typical configuration

The Page Maker for the PC costs \$695, for recommended use on an Intel Corp. 80286- or 8086-based system with at least 512K bytes of random-access memory, a 10-Mbyte or larger hard disk drive, IBM Enhanced Graphics Adapter or compatible card and a printing device. The PC version is not copy-protected, though the Macintosh implementation is and will remain copy-protected in its next version, Brainerd said.

Features of the Page Maker PC version will also appear in updates of the Macintosh version, Brainerd said. Among them are such typesetting features as automatic hyphenation, kerning (variable spacing of characters) and drivers for a variety of scanner input systems. It can be used to create documents of up to 128 pages, up from 16 in the Macintosh version, and can display facing pages simultaneously.

Like the Macintosh version, the PC version includes a driver for printers running the page description language Postscript from Adobe Corp. It also supports the Document Description Language (DDL) from Imagen Corp.

Under Windows, Page Maker will be multitasking, but true multiuser capabilities through networking will not be available until later versions, Brainerd said.

User demand bucks 'trend'

From page 1

in early 1987.

Like the Shearson Lehman and the bank's systems, most of the early Model 400 deliveries will be upgrade packages to expand existing 3090 Model 200 dual processors into four-CPU Model 400s. Factory-configured Model 400s still are scheduled for October shipment.

However, one executive of an East Coast insurance company that advanced delivered a Model 400 to the fall said the company will not use Model 400 as two Model 200s to optimize the power. She said installing a Model 400 allows flexibility to use it as a single system at a later date.

"We plan to run the 400 as two 200s. Why put them together and lose five MIPS?" asked the insurance executive, claiming that a Model 400 will perform about 50 million instructions per second (MIPS), while Model 200 operating independently perform a total of 55 MIPS.

One company that has delayed its Model 400 is Blue-Cross/Blue Shield of Kansas in Topeka, which had planned to replace its IBM 3084 Model Q with a Model 400 in December

but has now deferred that move until late 1987.

"We had had a capacity projection based on the last 24 months when we saw lots of growth because of a heavy migration to on-line transactions during that period. Plus, our new claims process reduced our backlog, which ended up reducing the overall processing," said Blue Cross's hardware and software analyst Gary Hudson.

"Summit" speculation

Hudson added that his company is re-examining the idea of moving to the Model 400 at all, particularly in light of analyst speculation that IBM will replace the 3090s with a system code-named "Summit" within a few years.

"We also got to analyze the 3084 and 3090 technology and didn't see anything that the 3090 offered us above and beyond the 3084. We decided to wait and see what IBM does and possibly skip the 3090 and see what they have with the Summit line," Hudson said.

He noted that his company found a 6% to 7% performance gain in a performance improvement feature added to the 3084 when the 3084 Model X units were introduced and is considering the addition of an older IBM 3081 as an extra processor.

A user organization that is not im-

Broad data base access link unveiled by Micro-Tempus

By Elizabeth Newlett

Staying close to a year's march on IBM, Micro-Tempus, Inc. last week announced Tempus-Access, a comprehensive micro-to-mainframe product that it claimed is easier to use than IBM's Advanced Connection Facility (ACF).

Tempus-Access enables the IBM Personal Computer users to select, sort and extract data from a wide range of IBM mainframe data base and system environments and download it into almost any popular microcomputer application, the company claimed. IBM's ACF, a micro-to-mainframe link announced in June, is scheduled for third-quarter 1987 release.

The Micro-Tempus' product was designed to give microtechnological users through IBM's mainframe maze of different terminal emulations, operating environments and data base structures," President Yvon Leveille said. "It provides users with a common view across the different environments."

By filling in the blanks on a multiwindowed screen, users can specify the fields they want to access, the selection parameters and the sorting order for up to 60 fields. A record-sorting limit controls the amount of mainframe processing power taken up by any given job.

Requests are sent to DYL-270, a software product from Sterling Software, Inc.'s Dycware division (formerly Informatics General Corp.). DYL-270 is a data base extractor that reads any sequential, ISAM, BDAM, VSAM file structure and also interfaces with proprietary data bases such as IBM's IMS and DL1, Cullinet Software, Inc.'s IDMS and IDMS/R, and Applied Data Research, Inc.'s Datacom/DB.

Security feature

DYL-270 extracts the requested data from mainframe files and loads it into a virtual disk that micro users can then access. "Containing users in one section of the mainframe provides the MIS manager with more control," Leveille said. The product's security feature can limit a user's access down to the field level, he added.

As data is loaded into the virtual disk it is converted to the comma-separated variable format, which is compatible with a wide variety of IBM PC software packages.

pacted by early deliveries of the Model 400 in the Salt River Project in Phoenix. The power project's assistant general manager, John Jacobs, said the organization eased its capacity pressures on its Model 200 by employing a practice of off-loading applications to dedicated IBM 4381 processors. The Salt River Project still plans to acquire a Model 400 as originally scheduled in mid-1987, according to Jacobs.

Those users who said they were moving to the Model 400 reported that increasing demand in on-line and transaction processing is the primary reason.

"We've been using the 200 for on-line and development work. It's the only CPU we have installed, so it's really been doing everything. We ac-

quired a company a year ago April — Western Casualty of Fort Scott, Kan. — so we have a lot more transactions to handle in our computer requirements," reported Karl Kasten, vice-president and DP manager of American States Insurance Co. in Indianapolis.

One of Shearson Lehman reported that his company's Model 200s have performed as well as promised and that most of the performance gains have been in batch environments.

However, he said he expects the Model 400s to absorb an increasing demand for on-line processing.

Staff members *Rosemary Hawatton, Niamhary Baba Maginnis and Jeffery Bevier* contributed to this report.

TOP OF THE NEWS

NEWS from page 1

for a dual-drive version, speculates George Colony, president of Forrester Research, Inc. in Cambridge, Mass., who dubbed it the AT Jr. Colony said IBM will cease production of the PC XT in the first quarter of next year and sell off its inventory through 1987.

General Electric, which created a splash by negotiating microcomputer software site licensing agreements with Computer Associates, Inc. and Office Solutions, Inc., is expected to announce new agreements this week. Company officials declined to identify the firms involved.

In a Solomon decision, Burroughs last week announced the merged company formed by itself and Sperry will be headquartered in both existing central sites of Detroit and Blue Bell, Pa. The company said it considered consolidating headquarters divisions in a third location, and a Sperry official said last week that Princeton, N.J., and Washington, D.C., had been considered, as had both Detroit and Blue Bell.

President Reagan is expected to renew the executive order banning sales of U.S. computers to South African apartheid-regime agencies. White House and industry sources said. The order will expire Sept. 9, but Reagan is likely to extend the antisepartheid sanctions in hopes of forestalling congressional moves to enact a nearly complete trade embargo. A Senate bill includes the same computer ban as in the presidential order, but the House bill would force all U.S. firms to pull out of South Africa.

Sperry will announce Wednesday the Sperry PC Micro II, an 80286-based IBM Personal Computer-compatible microcomputer, running at 8 MHz with zero wait states and a small footprint. The machine will start at \$2,300 for a diskless version and fits five full-size expansion boards. Running Microsoft's Xenix, the machine can support up to five users.

Following recent layoffs at Intel and Advanced Micro Devices, Inc., analysts have their eyes on National Semiconductor Corp. "Although National Semi's billings have increased of late, its orders have been on the downswing. 'We are seeing more layoffs in the whole industry,'" says E. F. Hutton's Edward White. "The problem is not too little revenue. The problem is the cost of doing business. It is still way too high for the level of business they are seeing."

Sun Microsystems and Unisys Corp. last week announced that Unisys will sell Sun's Network File System (NFS) on its Unix-based operating system, Unixplus+. Sun's NFS distributed file system will be offered as the standard file system for Unixplus+. NFS provides users with the ability to transparently access files across a network of different systems from different vendors.

Publishing package debuts for IBM PC

By Douglas Barney

MOUNTAIN VIEW, Calif. — Software Publishing Corp. last week officially announced the Harvard Professional Publisher, a \$495 microcomputer desktop publishing package based on technology the firm acquired from Best Info, Inc. of Springfield, Pa.

The Software Publishing announcement underscores a trend to offer desktop publishing on the IBM Personal Computer and compatibles, rather than on the Apple Computer, Inc. Macintosh computer, which still dominates that market.

Software Publishing has high hopes for the package. "We expect our product to be one of the leading

high-end IBM PC-based desktop publishing products," said John Monson, senior product manager of Professional Publisher.

Aimed at experienced users

The company will market the product to users with prior publishing experience. For first-time users, the firm will offer Personal Publisher, a \$195 product with less functionality, Monson said.

One analyst who has seen the product said the firm has a good chance of succeeding in what is rapidly becoming a crowded market.

"There seems to be a crowding, at least on the horizon, but that is to be expected when you see a large in-

stallment of IBM PCs that have no desktop publishing software on them," said Ajit Kapoor, director of electronic publishing market analysis for Ziff-Davis, Inc.

According to Kapoor, Software Publishing's solid dealer network will help the firm succeed. "They have the potential to be one of the leaders in this market," Kapoor said.

In addition, the market for desktop publishing software for IBM PCs and compatibles is growing rapidly. "In 1988, we see a crossover," Kapoor said. In that year, approximately \$800 million in IBM PC-based desktop publishing software will be sold vs. \$700 million for the Macintosh, Kapoor said.

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NEWS

Cost, quality complicate shielded vs. unshielded wiring choice

MIS managers wrestle with cabling options

By Elizabeth Howitt

The IBM Cabling System is complicating the lives of MIS managers shopping for a new building wiring plan to support their firms' voice and data communications needs.

Managers now face the dilemma of whether to save money by using Type 3 unshielded twisted-pair wiring that may already exist in their buildings or to install Type 2 shielded twisted-pair wiring, which costs more but has far greater data capacity. Some MIS managers, like nei-

ther of these options, are waiting for vendors like IBM to give them the best of both worlds: unshielded twisted-pair wiring that can support up to 16M bit/sec data transmission. IBM included Type 3 unshielded wire in its Cabling System specifications for users "who are not ready to invest in a special wiring system," says IBM network systems planning manager James Weston. "Since it's already in the wall, unshielded wire is an inexpensive way for a company to get started."

However, unshielded Type 3 wiring has found little favor with MIS managers because of its limited transmission capacity, according to the Los Altos, Calif., research firm International Technology Group (ITG). Out of some 30 IBM Cabling System users directly surveyed by ITG, no company was using the Type 3 unshielded wiring. "There are too many questions about its ability to handle traffic," says Claire Fleig, ITG's director of systems research.

In contrast, the shielded Type 2 wiring has so far found a limited market, primarily among IBM shops that are wiring new buildings. "Type 2 is most cost-effective when you can put it into the wall during construction," Weston admits.

Mark Freund, marketing director of Interconnect Network Consulting Group of Pasadena, Calif., recently convinced United Way of the Bay Area to install the Type 2 shielded wiring as well as an IBM Token-Ring network in its new office. Freund concluded that the cost savings to be realized by using Type 3 wiring were insignificant when weighed against the risk of running out of data capacity at some future date. "Say you save \$1 per foot now by using unshielded instead of shielded twisted-pair wiring," he says. "That's nothing compared with the cost of replacing your wiring system five or 10 years down the road."

Freund contends that while unshielded twisted-pair wiring will work for an IBM Personal Computer network at 1M and 2M bit/sec, or for a Token-Ring with five workstations, at greater speeds and with more nodes, "you'll have delays caused by bad packets and a scenario where the accounting department waits 10 min-

utes for a purchase order to appear on-screen."

IBM's Weston agrees that unshielded twisted-pair transmissions are vulnerable to electrical interferences that are frequently generated in a building. However, he contends that high-quality unshielded wiring

and to find a way for unshielded twisted-pair wiring to support a 16M bit/sec Token-Ring network. When that happens, they will install both the Token-Ring and the wiring."

Of course there are exceptions to this rule, especially among companies with modest data communications needs that are not expected to grow significantly in the foreseeable future. Such a company is Bank of Delaware in Wilmington. Last year, the bank started planning for a wiring system for its new headquarters building. "We wanted the most cost-efficient and forward-thinking wiring that would allow our network to grow in size and sophistication without burdening ourselves with unnecessary technology," says Jo Petre, assistant vice-president of administrative services.

Consultants at Network Strategies, Inc. recommended AT&T's Premise Distribution System (PDS), an unshielded twisted-pair wiring scheme very similar to IBM's Type 3 cabling. IBM had not yet announced specifications for Type 3 at the time. According to Vice-President of Data Processing James Massingale, "IBM Cabling System Type 2 would have cost us 40% more than PDS, primarily because of the wiring's price per linear foot, but also because of greater electronic connection costs."

IBM Cabling System Type 2 reportedly costs approximately \$450 to \$750 per drop, depending on building size. AT&T figures were unavailable.

According to Network Strategies Group Manager Jeffrey Held, PDS can support the bank's new installation: five floors that will house, in addition to an IBM 4381 mainframe, 200 to 250 3270 Personal Computer terminals and some IBM PCs and a Wang Laboratories, Inc. Office Information Systems minicomputer. PDS can handle 2.7M bit/sec. IBM 3270-terminal-to-host links and 3M bit/sec. Wang terminal-to-host links over distances of up to 1,000 feet, Held claims. "PDS can even support the 4M bit/sec IBM Token-Ring, as long as you limit the length and number of devices on the network," he adds.

"For what we plan to have, PDS is fine," Massingale says. "For 1,000 terminals all busily doing data entry, it wouldn't work."



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utes for a purchase order to appear on-screen."

IBM's Weston agrees that unshielded twisted-pair transmissions are vulnerable to electrical interferences that are frequently generated in a building. However, he contends that high-quality unshielded wiring

will support a Token-Ring of up to 72 workstations (compared with a 250-workstation maximum for Type 2 cable) and speeds of up to 4M bit/sec. Shielded twisted-pair can support 16M bit/sec., a rate unshielded can support only over very short distances.

Type 2 has been installed in some 450 new buildings, ITG says. But its image as "the Mercedes among twisted-pair wiring schemes," as one cabling distributor spokesman puts it, apparently has put off some companies that are thinking of retrofitting existing sites with new wiring.

But neither are companies installing networks on their existing cable, even if it meets IBM's Type 3 specifications, says ITG Managing Director Brian Jeffery. "My impression is that companies are playing a waiting game. They expect IBM to connect more of its systems to the Token-Ring

and to find a way for unshielded twisted-pair wiring to support a 16M bit/sec Token-Ring network. When that happens, they will install both the Token-Ring and the wiring."

Of course there are exceptions to this rule, especially among companies with modest data communications needs that are not expected to grow significantly in the foreseeable future. Such a company is Bank of Delaware in Wilmington. Last year, the bank started planning for a wiring system for its new headquarters building. "We wanted the most cost-efficient and forward-thinking wiring that would allow our network to grow in size and sophistication without burdening ourselves with unnecessary technology," says Jo Petre, assistant vice-president of administrative services.

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Court convicts student in grade-fixing scam

By Susette Burton

A former University of Southern California (USC) student has been convicted of using a university computer to change his own grades and could face up to four years and four months in state prison.

Mehrdad Amini, 23, a native of Iran, was held in custody since February on \$100,000 bail and is scheduled for sentencing this week, according to Deputy District Attorney Stephen Pfleider of Los Angeles. Pfleider also said that this is the first case in which students were prosecuted for changing grades. He said he will recommend a higher sentence than he would normally suggest on a crime of this kind because Amini has

undermined the credibility of a major American university. The incident has been called the worst cheating scandal in USC history.

Although a Los Angeles Superior Court jury earlier this month found Amini guilty of changing his own grades, it was unable to reach a decision on whether he also changed other students' grades for money, despite the testimony of two former students who said they paid Amini between \$1,000 and \$3,000 to have their grades changed.

Seventeen students were reportedly involved at USC after an investigation that began in mid-1984.

Robert Morley, USC associate director of registration and records,

prosecuted the cases but could not be reached for comment.

Amini was the middleman in the alleged scam, Pfleider said. Darryl Gillard, 27, a former USC employee who worked in the registration and records office and whose employment was terminated in May 1983, physically changed the grades.

Gillard, who testified against Amini, pleaded guilty to charges of illegal computer access and selling cocaine and will be sentenced to less than two years in prison.

Also involved in the case is another former student at USC, Manuel Roberts, 23, who reportedly paid Gillard to change his grades. He faces one count of illegal computer access.

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|-------------------|-------|
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| 2 DEC | 12.2% |
| 3 IBM | 12.2% |
| 4 Software Vendor | 7.3% |
| 5 Hardware Vendor | 7.3% |

SOURCE: 1986 Software User Survey*

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U.S. SEMINARS

	Northwest	Orlando	Sept 5	General Reps	Oct 16	Cincinnati	Aug 5, Oct 22	November	Aug 15, Oct 14
AK Anchorage	Sept 9		Sept 17, Nov 18	NY Minneapolis	Oct 22, Nov 26	St. Louis	Jul 22	Oct 16, Nov 20	Oct 20, Dec 4
AL Huntsville	Sept 9		Sept 6	Tampa	Nov 4, Dec 18	St. Louis	Jul 22	Lubbock	Oct 2
AL Mobile	Sept 10		Sept 23, Nov 11	MO Kansas City	Nov 12	St. Louis	Aug 12	San Antonio	Aug 27, Sept 5
AL Little Rock	Sept 30	IA Des Moines	Oct 8	St. Louis	Nov 12	St. Louis	Sept 10	St. Louis	Sept 4
AZ Phoenix	Sept 9, Oct 13	IL St. Louis	Oct 25, Nov 11	NC Charlotte	Nov 12	Dayton	Sept 5, Nov 5	Dayton	Oct 7, 14
CA Los Angeles	Sept 5, Sept 11, Oct 14, Nov 13, Dec 16	IL Chicago	Sept 14, Sept 21, Oct 5, Nov 8, Dec 18	NC Raleigh	Oct 12	Oklahoma City	Sept 3, Dec 3	VT Burlington	Aug 6
CA San Francisco	Sept 5, Sept 11, Oct 14, Nov 13, Dec 16	IN Indianapolis	Oct 5, Nov 12	NC Omaha	Sept 24	Tales	Aug 26, Nov 19	VA Richmond	Sept 10
CA Sacramento	Sept 25, Nov 11	IN Indianapolis	Oct 18, Dec 5	NC Charlotte	Sept 24	OR Portland	Jul 24, Sept 23, Nov 10	WA Seattle	Oct 23, Dec 12
CA Newport Beach	Sept 25, Nov 11	IN Indianapolis	Oct 25, Dec 5	NC Charlotte	Sept 24	PA Philadelphia	Sept 11, Nov 11	WI Milwaukee	Sept 5, Nov 12
CA San Jose	Sept 5, Sept 11, Oct 14, Nov 13, Dec 16	KS Wichita	Sept 4	NC Charlotte	Sept 24	PA Philadelphia	Sept 9	CA San Francisco	Sept 25
CA San Diego	Sept 5, Sept 11, Oct 14, Nov 13, Dec 16	KY Louisville	Sept 7	PA Philadelphia	Sept 24	PA Philadelphia	Oct 16, Dec 1	CA San Jose	Oct 16
CA San Francisco	Sept 5, Sept 11, Oct 14, Nov 13, Dec 16	LA New Orleans	Sept 10, Dec 11	NY Princeton	Sept 24	SC Greenville	Aug 6	CA San Francisco	Oct 16
CA San Jose	Sept 5, Sept 11, Oct 14, Nov 13, Dec 16	LA New Orleans	Oct 15, Nov 12	NY Albany	Sept 24, Nov 16	SC Greenville	Oct 7	CA San Jose	Sept 17
CO Denver	Sept 18, Oct 23, Dec 10	MD Baltimore	Sept 10, Dec 11	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 18	CA San Jose	Sept 18
CT Hartford	Sept 10, Oct 13, Dec 13	MD Baltimore	Sept 15, Dec 11	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 19	CA San Jose	Sept 19
DE Newark	Sept 20, Oct 13, Dec 13	MD Baltimore	Sept 4, Oct 1, Oct 16, Dec 25	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 20	CA San Jose	Sept 20
FL Ft. Lauderdale	Sept 20, Oct 13, Dec 13	MD Baltimore	Sept 10, Dec 10	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 21	CA San Jose	Sept 21
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FL Ft. Lauderdale	Sept 20, Oct 13, Dec 13	MD Baltimore	Sept 15, Dec 11	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 40	CA San Jose	Sept 40
FL Ft. Lauderdale	Sept 20, Oct 13, Dec 13	MD Baltimore	Sept 15, Dec 11	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 41	CA San Jose	Sept 41
FL Ft. Lauderdale	Sept 20, Oct 13, Dec 13	MD Baltimore	Sept 15, Dec 11	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 42	CA San Jose	Sept 42
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FL Ft. Lauderdale	Sept 20, Oct 13, Dec 13	MD Baltimore	Sept 15, Dec 11	NY New York City	Sept 24, Nov 12	SC Greenville	Sept 47	CA San Jose	Sept 47
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Bank positions sales management with micro-based LANs

System speeds data access, links offices

By Jeffry Bealer

Security Pacific National Bank recently completed a \$6 million automation project aimed at sharpening the financial institution's ability to spot sales opportunities in the lucrative and competitive wholesale banking arena.

In a strategic application of information technology, the U.S.'s eighth largest bank has placed microcomputer-based local-area networks (LAN) in each of the roughly 40 Business Banking Centers (BBC) it operates throughout California.

Developed by Security Pacific Automation Co. (SPAC), the bank's data processing services subsidiary, the LANs greatly speed access to the information that the bank's automation division's Business Banking Division (BBB) uses to pick its prospects and tailor its individual sales pitches.

"Our system is definitely on the leading edge of technology," said John Griffith, a Security Pacific senior vice-president and head of the BBB. "After having talked to outside vendors, we've concluded that there's probably no other system like ours anywhere in the marketplace."

Launched approximately three years ago, SPAC's automation project allows the BBB to draft and revise its

loan documents electronically.

With the help of assorted integrated software packages, the LANs have also automated the division's credit analysis process.

"Our new technology has doubled the speed with which we can do financial projections and thus has given our account officers more time to spend in the field, servicing existing clients and developing new business," Griffith said.

But by far the technology's most important function is as a sales management system for

BBCs, which serve so-called "middle-market" accounts — companies with annual revenue ranging from \$5 million to \$100 million. Using its own local Novell, Inc. networking system, each center, for the first time, is now able to keep track electronically of which banking products and services its sells to a given client.

The Novell LANs also collect historical information that gives an indication of what kinds of loans or cash management services are typically used by businesses in a specific

industry group.

Access to such information aids BBC account officers greatly in uncovering potential customers. "When we approach a prospect, we'll know, based on our historical data, exactly what types of services that partic-

ular business

should have," said John Crodin, the BBB's vice-president for planning and marketing. "We will then be able to discuss those products with the prospects."

The same LAN-supplied infor-

mation will also enable ac-

count officers to pinpoint sales

opportunities among cus-

tomers by tracking the clients' current portfolio of bank-

ing services, Crodin said.

"Without the new technology, our ability to respond promptly to customer needs almost certainly would have lagged," Griffith said. "Other banks would have beaten us to the punch and passed us by in the middle market."

In the past, the BBCs recorded the results of their sales and prospecting efforts on tickler cards. But under the previous system, retrieval of

needed information took "massive amounts of time," according to Griffith.

"To find out what was happening in a certain office, we would have to contact the location, which would then consult the tickler cards and report to us manually."

With the automated system, customer and prospect information is downloaded from public data bases and from an Amdata Corp. 470V/8 at the bank's data center in Brea, Calif., near Los Angeles. The information goes first through T1 lines to a Novell LAN in Security Pacific's application development center in neighboring Glendale, Calif.

After being massaged and reformatted, the information is then routed over phone lines to the appropriate BBC, where it is stored in Novell S/Net LANs, according to John Lafare, vice-president of SPAC's Distribution Banking System.

Attached in a star topology to each remote S/Net is a network of floppy-disk-based IBM Personal Computers, which are used to run local data base inquiries and extracts.

Periodically, the BBCs also upload selected sales and prospect information to Security Pacific's host mainframe, where the material is centralized and used to generate management reports, Lafare said. From the reports, Griffith and his superiors can then assess each BBC's financial performance.

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TRBA Adv.

NEWS

Cobol-based AI shell bows

From page 1

led the effort to produce M&D's Millennium accounting series.

According to Landry, the inference engine of the shell can be called by a Cobol application to act on the rules in a knowledge base created by the user. The shell, written in Cobol, provides both forward- and backward-chaining reasoning methods, Landry said.

Most expert systems and expert system shells have been written in LISP or Prolog, requiring dedicated hardware; a few are available in the more portable C language. Only a handful, however, have been designed to run on IBM mainframes, and observers of the artificial intelligence field say the DMS product is one of the first designed to operate with mainframe applications.

"Up until a year ago, expert systems had a tendency to be islands of technology," noted Tom Schwartz, president of Tom Schwartz Associates, a Mountain View, Calif., consulting firm. "You had to pick an application that didn't need to talk to anything else. Since a majority of business applications are data base driven, this will allow expert system technology to be integrated with data base technology."

Landry's history with M&D was also seen as a positive factor for the DMS product. "He's the first guy in

the inference engine business who has a lot of credibility in mainstream system software," said Curt Monash of the Paine Webber, Inc. brokerage house in New York.

Top-level MIS executives in financial services companies expressed keen interest in the DMS approach. "I'm beginning to believe something like this is the only way of bringing expert systems to a banking environment," said George DiNardo, executive vice-president of the information management and research department at Mellon Bank N.A. in Pittsburgh.

However, DiNardo predicted mainstream commercial acceptance of AI techniques will be slow. "It takes time for it to leak into the culture of a systems development organization," he said.

Nothing need for linkage

David J. Blackwell, executive vice-president at Massachusetts Mutual Life Insurance Co., said that the claims for Impact/AE would seem to meet the need of linking expert systems to existing Cobol systems and data bases.

Blackwell said he has not been looking at IBM hardware as an expert system vehicle. Instead, Blackwell has been using a symbolic processing system on-line, but he said it is not used very interactively.

"Anything that can make us not have to use an AI LISP machine-type environment is welcome, so we can do it right on the mainframe," said Roger Scheim, vice-president, applied research/expert systems at

Cigna Systems, a division of Insurance Company of North America, a Cigna Corp. company.

"We need the AI/expert systems world integrated with the traditional processing area, where there already is a large investment in data bases and applications," Scheim added. "I'd like to use that expertise to look at vast quantities of data that flow through a system. That calls for embedding the expertise into the application."

DiNardo said AI and expert systems could be applied in a number of ways in the banking industry. In the credit area, expert system technology could be used to train new personnel to incorporate the expertise of a bank's loan committee for evaluating large loans and to aid a bank examiner in evaluating a loan portfolio.

In the trust area, expert systems could be used for selecting investment portfolio. And in currency arbitrage, which involves swapping numerous currencies, DiNardo said a good trader can deal well with two or three currency swaps, but a good expert system could better deal with a greater number.

Impact/AE users can use IF-THEN-ELSE logic to compare conditions found by the application to the rules in the knowledge base. A user may build the rules using simple, English-style statements, Landry said.

In addition to being able to be called by a mainframe application, the expert system developed from the Impact/AE shell may also access mainframe files, including VSAM, IBM's SQL and RMS, company

spokesmen said.

The shell will first be available to run on the Digital Equipment Corp. VAX line in October, since it has been developed at DMS on VAX minicomputers. It has not been released to any beta-test sites.

The version to run in IBM's MVS/CICS environment will be available in January, with an IBM Personal Computer version available in the first quarter of 1987. Impact/AE will be priced from \$55,000 to \$125,000.

Landry said he did not use LISP or Prolog for his firm's shell, because they are both "highly inefficient" and cannot be blended into the IBM mainframe environment.

Language is not crucial to the user. The language best suited for an expert system is the one that allows the user to write a program that calls the inference engine," he said.

The expert system shell includes a text editor and compiler to support text editing, optimization and debugging within the development environment.

End users may access the expert programs through a menu structure. Based on information provided by the user, the system will issue prompts for more information with automatic queries. The user may ask the system how it reached a conclusion, and the system will review step by step the rules it referred to, Landry said.

Impact/AE also provides a percentage estimate of accuracy on the conclusions it returns, he said.

Senior writer Eddy Goldberg contributed to this report.

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Software sales pact with Orion lets Philips products tie into SNA nets

Ten-year deal brings firm LU6.2 capabilities

By Eddy Goldburg

BERKELEY, Calif. — The Orion Group, Inc. is expected to announce tomorrow that it has signed an agreement with Philips International B.V. of the Netherlands to integrate two of Orion's communications software products into Philips' product line.

The multimillion dollar, 10-year pact is intended to allow Philips to link its products into networks supporting IBM's Systems Network Architecture (SNA).

The Orion Group will license its SNA62 Peer Communications Facility and Document Interchange Architecture (DIA) Source/Recipient Facility to the Dutch electronics giant, which will market them worldwide under its own label. /

Offering peer-to-peer capabilities

Orion President Paul Rampel says that he expects the deal will place Philips among the first European electronics manufacturers to offer the peer-to-peer capabilities afforded by IBM's LU6.2.

Orion's SNA62 Peer Communications Facility supports both IBM's LU6.2 and PU2.1 enhancements to SNA, enabling peer-to-peer commun-

cation between a variety of office computers and equipment.

The DIA Source/Recipient Facility allows users of the Peer Communications Facility to exchange Document Content Architecture formatted files with IBM's Distributed Office Support System.

Both packages are written in the C programming language.

Earlier LU versions to be combined

The agreement also reportedly provides for the joint development of a software package that implements LU0, LU1, LU2 and LU3, earlier versions of the SNA standard that support hierarchical network communication between a host and dumb terminals such as the 3270.

The combined package will be offered by Orion within nine months, filling out Orion's SNA product line, Rampel says.

He expects Orion to be the first company to offer LU6.2/PU2.1 capabilities integrated with the older LU architectures.

"It will allow a user to have coexistence with older applications based on LU0, 1, 2 and 3, and allow development under the new architecture with newly developed LU6.2-based applications," Rampel says. This should provide an easy migration path from old to new applications, according to Rampel.

Start-ups offer full-function solids modeling design systems

By James A. Martin

Solids modeling, like many other computer-aided design processes that were once exclusively run on large systems, is becoming a personal computer-based application.

At the Autodesk computer-aided design and manufacturing show in Detroit this November, Cadetron, Inc., a fledgling Atlanta firm, is set to introduce its first product, the Engineer Works. Also at Autodesk, Aries Technology, Inc. of Lowell, Mass., will unveil its Conceptstation.

Both systems are described as full-function solids modelers that run under Microsoft Corp.'s Xenix operating system on the IBM Personal Computer AT.

Earlier this year, Caetec Systems, Inc. of Atlanta released its solids modeling design system for the PC AT. Caetec's Professional Engineering Series, however, runs under IBM's PC-DOS operating system instead of Xenix, although it does run on the AT&T Unix-based Sun Microsystems, Inc. workstations.

"For a long time, PCs didn't have the computing power to run software as sophisticated as solids modeling," said Tom Couch, vice-president of marketing and product development for Caetec. "With the AT, micros are now approaching having the necessary power, and that's why we're

seeing the introduction of these very sophisticated software programs for micros."

Major redesign necessary

"Solids modelers were not designed for the desktop, so we had to redesign everything," said Richard Miller, vice-president of marketing for Aries. "We will have invested \$16 million to \$20 million to put this out."

Cadetron's basic Engineer Works system will retail for \$5,000, with all eight modules costing \$15,000 and a total system including all necessary hardware running around \$28,000, according to Jim Spencer, Cadetron president.

The Aries system, excluding the PC AT but including a high-resolution monitor, 60MB disk, 9MB bytes of random-access memory (RAM) and a proprietary 32-bit array processor, costs \$39,000, according to Miller.

Caetec's Professional Engineering Series, which consists of solids modeling, finite element modeling and analysis and other applications, retails for \$19,000. The system runs on a PC AT, not included, with 640K bytes of RAM and no requirement for add-on boards, Couch said.

Senior writer Rosemary Hamilton contributed to this report.



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World Digest

Glass-based disks to roll

TOKYO — Hoya Corp., a Tokyo-based Japanese optics and electronics firm, recently announced a glass-substrate magnetic diskette, which it claims has a memory capacity five to 10 times that of existing aluminum-based products, for about the same unit price.

The Hoya diskette, to be available in 3 1/2- and 5 1/4-in. versions, was developed jointly by Hoya and unnamed U.S. companies.

To create the product, Hoya applied a magnetic medium directly onto a glass substrate. Conventional diskettes require a layer in between the aluminum substrate and a recording medium.

According to a Hoya spokesman, the key to increased memory capacity is the smoothness of the glass substrate, which allows the aperture between the read/write head of the diskette drive and the diskette surface to decrease to submicron levels.

Mass production of these diskettes is scheduled to begin at a former Amplex Corp. plant in San Jose, Calif., this month.

Unlike most Japanese electronics manufacturers, Hoya, capitalized at \$34.6 million, plans to place the first lots for delivery on the U.S. market. "Reactions from U.S. computer vendors will provide us with a good litmus paper," the Hoya spokesman said.

ICL mull on Series 39 issue

LONDON — UK mainframe maker ICL PLC last week was tight-lipped over reports that it is about to launch a new version of its Series 39 Level 80 mainframe, although the firm reportedly has already supplied a system to a local authority near London.

The system is said to be halfway between the Level 80, which operates at 2.2 million instructions per second (MIPS) and the 11-MIPS Level 80. But ICL declined to comment on the rumors. "The move makes sense," said Philippe de Marcillac, research director of International Data Corp. Europa. "There is a big gap between the two systems."

When the Level 80 was launched in early 1985, ICL announced plans to bring forth two versions of the system by the end of that year and a quad-processor system with 36 MIPS by the end of this year.

"We hope to beat the IBM 3090 Model 400 to the marketplace with our quad-processor Level 80," the company declared at the launch. ICL hopes to use its Macrolan high-speed local-area network to create the multiprocessor systems.

Release of the dual version of the

system was pushed back until next year. So far, ICL has taken more than 200 orders for the Series 39 range.

Red tape snags Finn's 3090

HELSINKI, Finland — The Finnish State Computer Center must operate its IBM 3090 Model 160 mainframe without the vector processor initially ordered for use in scientific applications, due to government red tape. Currently under installation, the mainframe was to have been operational by the end of August and will be used by Finnish universities and other organizations for scientific purposes. U.S. authorities have not yet specified whether the IBM 3090/vector processor combination should be classified as a supercomputer. If it is, a special license will be required, permitting authorities to restrict the computer's uses.

Burroughs wins China deal

HONG KONG — The Hong Kong and Shanghai Banking Corp. has awarded its \$25 million worldwide banking terminal replacement order to Burroughs Corp., industry sources revealed last week. A letter of intent was sent out at the end of July, and the deal is set to be inked late this month or early in October, a bank source confirmed.

The deal covers the installation of up to 750 branch controllers, each running between 10 and 20 terminals. The value of the terminals alone

is estimated at \$7 million.

Sources close to the negotiations said the evaluation team had recommended NCR Corp., but a series of price reductions offered by Burroughs, coupled with the availability of new applications software, swung the decision in Burroughs' favor at the last minute.

IBM, which finished fourth in the ranking, is believed to have been scratched from the list weeks before the final decision because of its unwillingness to modify its systems to meet the stringent criteria of the bank, particularly in relation to signature verification on the proposed systems.

Fujitsu commits to AI market

TOKYO — Bolstered by projections that Japan's artificial intelligence market will multiply in size 45 times by 1990, Fujitsu Ltd. is boosting its efforts to develop AI software products.

At the core of the Fujitsu commitment is the vendor's E-Shell/FM, a personal computer-based expert development package.

Fujitsu's E-Shell/FM, which runs on its 16-bit PM16 Beta PC, is priced at \$2,940. The Japanese-language E-Shell/FM, slated to ship early this month, is said to support both the production and frame-type of knowledge bases.

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VIEWPOINT

EDITORIAL

The race for a faster chip

The personal computer industry appears to be getting ahead of itself and, in so doing, risks leaving behind a crowd of confused corporate users.

Just as the current crop of IBM Personal Computer AT-class microcomputers has made significant inroads into the office, the next generation of machine — built around Intel Corp.'s much-ballyhooed 80386 chip — made its appearance last week. The first of this new breed of PC AT-compatible systems came from Corvus Systems, Inc. It will be followed in short order by similar products from Compaq Computer Corp. and a raft of others.

In the face of all the hoopla over Intel's power-house chip and the grand new systems it will fuel, some users may be tempted to leap on the 80386 bandwagon, for fear of being left in the dust. Nothing could be farther from the truth. Thus, one savvy MIS director responded to the new machines: "Who needs a Corvette in a 15-mile-an-hour speed zone?"

Development trends over the past decade have reduced the size and increased the power that can be harnessed at the desktop by unimaginable leaps and bounds. Witness last week's announcement from the Hyundai Group, the \$10 billion South Korean conglomerate, that it intends to market a fully configured IBM Personal Computer XT-compatible computer and will sell it through discount stores for less than \$1,000.

But if the truth be told, even the current 80286-based machines simply have more power than the average user has yet digested. Granted, the so-called power users — for example, those who have large applications such as huge spreadsheets — are always yearning for greater speed. But they represent a relatively small segment of the overall PC market.

Now comes a new class of machines that boasts power and speed three times that of the Digital Equipment Corp. VAX 11/780, for years the standard in the mini/supermini-computer world.

Inpressive indeed. Not impressive, however, is the software currently available in the 80386 world. No one cares to predict when an operating system (initially Microsoft Corp.'s MS-DOS 5.0, eventually MS-DOS 6.0) will be available to take maximum advantage of the 80386. Applications software is yet farther away.

True, on the multiuser side, the chip should be popular with Unix system users. Unlike MS-DOS, Unix is better able to take advantage of the chip's power. There are even those who contend that multiuser systems based on the 80386 will cut into the supermini market, competing against VAXes and the like. But that, too, is deceiving: These new machines will not run the minicomputer operating systems, therefore, cannot compete directly against a VAX running VMS.

All of this plus the fact that IBM is expected to announce a 80386-based machine until well into 1987, leads us to think that MIS managers have good reason to bide their time. Power users, indeed all users, can afford to wait — for vendors to work out technical kinks in their systems and for prices to come down in the wake of the 80386 clones that are sure to spring up in the marketplace.



LETTERS TO THE EDITOR

Hacker skirmish improves security

Hackers are only interested in government or bank computer centers, right? They are only going to attempt to get into the super-duper mainframes, right? They are problems that the big shops have to worry about, right?

I used to think that.

I was jarred from this belief one morning when I checked the computer console. One of the first things I do each day is check the console to see if there have been any messages sent to it. What a surprise I got that morning when I saw several logon notices from the evening before. Since there was no message indicating trouble, I was confused. A quick call to the technical support service center verified that it had not been involved.

The idea of a hacker still did not enter my mind. The shop where I work has a small minicomputer; the staff consisted at the time of one programmer/operator, one secretary and one manager/programmer/secretary/vice-president. Our job was to support the county-level educational system with financial applications and student record-keeping. Nothing that could be turned into personal advantage was involved. Since nothing else seemed to be out of the ordinary, I chalked it up to one of the school districts having an evening conference.

The proverbial ton of bricks fell on me the next morning in the form of more logon messages and an open message from the hacker. He wanted to assure from the outset that he did not intend to cause any harm and that he was interested only in helping me improve the security of the system.

Well, it was as plain as the nose on my face that the system certainly needed some improvement in security, but I did not like his approach.

After several exchanges of messages in which he tried to convince me that his intentions, if not his methods, were honorable, I tried to convince him that, honorable or not, I could not risk the exposure of my system was getting, so we parted.

Actually, he was parted when I first canceled his access. In the short time it takes to dial a telephone number, he was back. I canceled him again, and he tried again!

I did admire his persistence as well as his knowledge of my passwords. Finally I had to shut down the entire system.

For the next two and a half days, my assistant and I changed every password in every program and every job stream. Since it was obvious that the hacker had access to a very powerful support pro-

gram that displayed any password requested, more was needed. We copied several such powerful utility programs to other locations and gave them meaningless, nondescriptive names.

We copied the entire sets of the technical support programs used only by the service personnel and put them on tape. We added additional levels of security to all systems.

The passwords were completely random, made up of numbers and letters, of varying length. Then we erased all of the original utilities that could be used to unlock the new security. Finally, we changed the electrical connections for all dial-up modems so that all could be turned off at the end of the day.

After we finished, we plugged in the modems and waited. It took less than three hours before the hacker was again trying to enter our computer. He tried for close to two hours, but he could not gain a toehold.

It cost us about a week of time, but we were lucky. Our hacker was not interested in doing damage. Some of the changes we made were changes that I had meant to make for months, even years. Others just came to mind while I was in my paranoid phase. All changes have been useful, I feel, in keeping the hacker from my electronic door.

Donald R. Wentz
Montgomery County Intermediate Unit
Norristown, Pa.

Multipurpose Amiga deserves praise

I wish to make a comment on the lack of articles concerning Commodore Business Machines, Inc.'s Amiga. Besides word processing, which the Amiga is very good at, I use it as a terminal emulator that interfaces at 2,400 bit/sec. into my company's mainframe using VT100 emulation.

My position requires 24-hour technical support of banking and insurance clients and access into various mainframes is crucial to my job.

Sure, the Amiga is new, but many business applications have been written or ported to it, and since Commodore is finally making a profit, the acknowledgement should be made: The Amiga is here to stay.

IBM and the clones are not the only business machines.

Bruce Donnelly
SEI Corp.
Cambridge, Mass.

VIEWPOINT

Computer ads: The cute, the pompous and the obscure

What is the purpose of the title of this article? To get you to read the first sentence. And what is the purpose of the first sentence? To get you to read the second one, of course. And the purpose of this paragraph and the next? To get you more and more committed until you have read the entire article.

Advertising follows similar rules: The purpose of the headline (and subhead, illustration or photo, if any) is to get you to read the first sentence of the copy and so on.

What kind of headline and subhead keeps you from turning the page? One that is provocative and interesting but also alienates someone about the product and its benefits. The first paragraph? Ditto.

The principles described above — rather briefly — have been proved over and over again, decade after decade, in every industry from buggy whips to radar detectors. But apparently there are those in the computer industry who believe that the computer world is different from the real world and that the tried-and-true marketing rules do not apply. Thus, they have devised an entirely new set of rules.

Rule No. 1: Be cute.

Use headlines like "Open up or

else," "Made for each other," "We have ways to make you talk" or "Imagine that!" Use pictures of dogs, birds, empty paper bags, racing cars and baskets of eggs in your ads. Since the benefits of using a new computer, peripheral or software package are difficult to communicate, particularly in a single page, do not even try. Hard-headed DP managers are really quite soft-hearted and will be so overwhelmed by the photo of two cute puppies in your ad that they will rush right out and buy your product.

Rule No. 2: Do not speak English.

I was particularly drawn to an ad with this head and subhead: "Turbo. Why are Sybex & Syncarta CMS the fastest things on no wheels?" Why, indeed? A few pages later in the same publication, I was invited to "attend a free four-hour 4GL/DBMS seminar." In the body copy, I learned that the so-called 4GL turns out to be just SQL or C. And then there is the "Speedup" product (I'm not even sure if it is hardware or software) that lets you "switch from five frequencies including the standard 12 MHz. Use reliable frequency synthesis to allow compatibility with all IBM ATs including the Type 2 and Model 230." Sounds terrific.

Rule No. 3: Use abbreviations.

Find a spokesman who is well known and well liked. Very few of these people know anything about

computers, but that makes no difference. Customers will buy anything celebrities tell them to. Just look at the success of Alia Aida, David Banner, Roger Moore, Don DeLuise, William Shatner and John Cleese. (You get ten points if you can name the computer that each of these celebrities hawked.)

Rule No. 4: Do not mention price. Although in industrial advertising research studies, 97% of the respondents say they are

more likely to read an ad that shows price, you can assume either or both of the following: They do not want to see prices that are over \$15.95, or price does not really matter because it is the company's money. Instead of showing price, use phrases like "outstanding value," "investment in the future" and "more features for less money."

Rule No. 5: Use meaningless subtitles.

A word processing package claims to have "unparalleled business features." That is certainly tough to argue with. How about the company whose "competitors are advancing that we win more major contracts than our competition?" And then there is a board manufacturer that promises that "performance exceeds demands." Whose demand, theirs or mine, is not specified. One company claims to have the "fastest DASD management system." If you define your own uni-

verse narrowly enough, it is not hard to have the fastest — as well as the only — direct access storage device product in it.

But if your product is not faster or better, and it falls in a well-defined product category, what do you say about that? That is, say, follow the lead of one software manufacturer and call it "the emerging standard."

Rule No. 6: Choose a pompous, wordy slogan.

Remember slogans like "I'd walk a mile for a . . ." or "things go better with . . ." or "breakfast of champions?" Sure you do. And I will bet you can name the products in two seconds. Now, contrast those punchy slogans with these gems from the computer industry: "together, we can find the answers," "the leader in information systems software," "in touch with tomorrow," "superior software by design," "a superior way for organizations to solve key data processing problems" and "we're developing technology for you." (Points will be awarded if you can identify just one company from the above slogan.)

Those who follow these rules to the letter and find that sales are declining may want to strike out on their own and follow the lead of companies like SAS Institute, Inc., Televideo Systems, Inc. and Teknowledge, Inc. Unlike the majority in the field, their ads are punchy and informative, communicate benefits and price and make me want to buy the products. And that's what it's all about.



By DAVID H. AHL

In defense of the relational DBMS model

As a development manager with more than 15 years' experience evaluating and using a variety of data base management systems and other software development products, I am not surprised that there are usually a variety of opinions on the best techniques, tools and products to provide DP support for various business uses.

What does surprise me, however, is the wave of ongoing misconceptions and resulting misstatements concerning the relational DBMS model and its various implementations. I see a need to try to establish a better and broader perspective on what this relational DBMS theory and practice is all about.

I would like to follow the thoughts on the relational model:

The relational model is just that — a model. A model that by itself cannot accomplish any useful units of work but certainly can and does serve as a guide for vendors in designing DBMS implementations. However, in making comparisons or criticisms, one must be consistent and not attribute failings or problems with a particular implementation to the model itself, if the feature in question in fact is part of the model (and

vice versa).

For example, the model calls for referential integrity rules to be present, but some relational implementations do not have this feature fully implemented. Therefore, one could contend that the model does not need referential integrity or that the given implementation does not adhere to the model. But to say or imply that because a given implementation does not have referential integrity, the model does not need it, is not only faulty logic, but also incorrect.

The relational model is grounded on well-founded mathematical set theory, and its originators, E. F. Codd and Chris Date, are noted practitioners with many successful DBMS and operating system implementations at IBM. Further, there are already some vendors that are developing more efficient, sophisticated and complete implementations of DBMS that adhere to the relational model.

Much as earlier nonrelational DBMS implementations evolved over time to provide greater capability, efficiency and functionality, so too will implementations of the relational model.

One of the most basic and important features and requirements of the relational model is the separation of the way data is presented to end users

and programmers, from the way it is physically defined, structured, stored and accessed. Thus, not only is there no specific physical data access method required or prescribed by the model, but, conversely, various physical data structure access methods can be theoretically compatible with an overall relational implementation.

Relational DBMS vendors will continue to provide for including existing physical access alternatives along with newer and better physical access and structure methods that can continue to change and improve as the technology allows.

The relational model is based on well-founded mathematical theory, which is unintelligible to many of us; thus, Codd has also described the model in terms of rules or functions that must be present for any implementation to meet relational criteria. In doing so, he is not stating that any particular vendor's product must follow these rules to be successful, but merely that any such product must follow these rules if it is to be considered as relational.

Herein lies the source of many misconceptions and myths. Certain vendors and other critics have taken exception to the various rules (usually ones their products do not have). They have tried to imply that their

own criteria and interpretations are more valid or correct, but to preserve some of the benefits attributed to the model, they use an "improved" relational-like, relational-based, near-relational or relational-flavored and so on. To eliminate such partial truths, critics ought to either create their own separate fully defined relational model (and identify it as such) or eliminate all reference to the term relational and just concentrate on features and functions provided.

From a good business standpoint, users should not be looking to acquire a relational DBMS — they should instead define a set of business requirements and related evaluation criteria for the functions they want a DBMS to do for them. Then the various products available can be evaluated objectively on business criteria and not empty and confusing buzzwords.

The real promise of the relational model is not yet realized in the sense that no current implementation provides all the solutions and capabilities the user community is looking for, but there are certainly indications that progress is being made. It is at this level of practical implementation capabilities that our industry should spend the time evaluating, criticizing, correcting and moving ever forward in making our lives easier, users happier and our companies more profitable.

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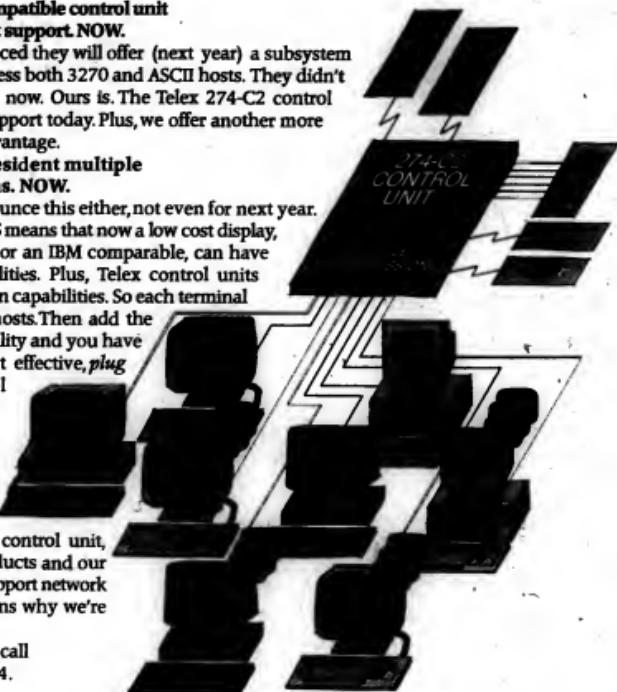
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SOFTWARE & SERVICES



SOFTLINE
Frank Sweet

Dictionary for data's data

A data dictionary is a computerized collection of record layouts. To support data base applications, it must include five features: data processing, documentation, user documentation, independent data elements, accessibility to application languages and accessibility to the data base management system.

Record layouts tell what kind of data is found in a file. A personnel file's layout, for example, shows that each record holds an employee number, name, job title, salary and the like. For each data item, the layout tells how long the item is (name might be 60 letters long, job title might be 15), whether arithmetic may be performed on it ("yes" for salary, "no" for employee number) and, if so, how the number is encoded (binary, floating point, packed decimal).

The personnel file's layout is a blueprint or template to which every employee record conforms. The layout itself tells nothing about any particular employee; that is the role of the records described by the layout. In other words, the personnel file holds information about employees. Call it "people data." The layout holds information about the data in the personnel file—data about data. In philosophical terms, I suppose, one could call it "metadata."

Developers must know the size, format and encoding of a file's data items

See **DICTIONARY** page 21

Sweet is a free-lance data base consultant in Jacksonville, Fla. He publishes "Boxes and Arrows," a monthly newsletter for Cullinet Software, Inc. IDMS users.

With ORACLE version 5, you have half the computer you thought you needed in order to "go relational." Some benchmarks indicate you save even more.

WHY IS VERSION 5 OF ORACLE SO FAST ON MAINFRAMES, ON MINIS AND ON MICROs?

□ REASON #1: AI OPTIMIZES QUERY PROCESSING.

VS applies artificial intelligence to SQL query optimization. For example, few DBMS can optimize a query that access 90 days overtime and accrues over \$10,000." But only ORACLE can optimize "Select accounts 90-days overtime or accounts over \$10,000."

□ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE ARRAYS OF DATA.

VS allows DBMS to always deal with logical sets of data. But they manipulated only one physical record at a time. VS eliminates

overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

□ REASON #3: PARALLEL PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE. VS is 100% re-entrant shared

code, and ORACLE's parallel-processing architecture fully exploits modern dynamic quadrics processor power on IBM and other parallel-processing computers such as those from DEC and Sun. So ORACLE uses all the MIPS in parallel-processor configurations.

Mapper gets application kit

Reactions mixed to tool's documenting requirements

By Charles Babcock

BLUE BELL, Pa. — A computer-aided tool kit has been added to Mapper, Sperry Corp.'s fourth-generation application development system, to help users design, build and maintain applications.

Mapper Kit enables a user to review from an easy-to-use, Barney J. Foster, Mapper administrator at Nike Inc., a Beaverton, Ore., athletic shoe manufacturer.

Another early user, Carnival Cruise Line of Miami, Fla., dropped its use of the kit after an initial trial because it did not want to commit its resources to the documentation requirements of the system, said William Ball, manager of system support. "We're a very unorganized shop. Mapper Kit imposed a lot more documentation than we wanted," he said.

Mapper is an end user-oriented system with an associated data base management system that has been in use for 15 years within Sperry and generally available for six years. It has an installed base of 2,000 units and runs on Sperry mainframes, mini and micro hardware, Sperry officials said.

Mapper has been used by Arthur Young & Co. and James Martin Associates for its easy-to-use and broad set of information processing facilities.

Adding the tool kit to Mapper addressed several weaknesses that were inherent in the product, according to Foster, a Mapper user for five years and a beta-test site of Mapper Kit for the past 18 months.

Although Mapper allows quick application development, the Mapper Kit imposes discipline on design and documentation, he said. "It's nothing really spectacular, but it does allow us to do some good analysis and structured design," he noted.

See **MAPPER** page 20



M&D promises; users want action

By Maura McNamee

RENO, Nev. — At McCormack & Dodge Corp.'s Ninth Annual User Group meeting in Reno, chief executive Frank Dodge pointed to his company's recent reorganization as its strongest asset.

It has been more than a year since M&D saw the defections of technology guru John Landry, chief architect of the company's Millennium fourth-generation language, and Vice-President of Marketing Bob Weiler. Since then, M&D has completed a major reorganization [CW, Aug. 18] and added several key employees, including former ITT software specialist John Birch as vice-president of research and development.

Industry observers have wondered how the departures would affect the financial applications software company, and Dodge's introductory remarks at the Bally's Grand Hotel in Reno attempted to soothe some of those concerns. "We now have a stable, unified executive com-

See **M&D** page 20

NEW THIS WEEK

■ Martin Marietta offers an on-line bulletin board for Ramis II users

■ For more on this and other new products, see page 73-88.

INSTANT ANALYSIS

"Language is not crucial to the user. The language best suited for an expert system is the one that allows a user to write a program that calls the inference engine."

— John E. Landry, chairman of Distribution Management Systems, Inc., on the need of intelligent/AI, an expert system shell

GET HALF-A-COMPUTER FREE WITH ORACLE VERSION 5



□ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

VS takes data from different tables on the same physical disk page. This technique—called multi-table clustering—permits you to access data from multiple tables in one disk read operation. Clustering of ORACLE data can improve performance on all multi-table operations, such as join queries, update transactions, etc.

□ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION.

As dbc relational queries frequently request that data be grouped, ORACLE has added a high-speed VS internal sort facility to perform aggregation and elimination faster, easier than previously possible.

□ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THROUGHPUT.

Row-level locking and a need-consistency model optimizes ORACLE VS transaction concurrency. For the

first time, high transaction throughput is achieved by a relational DBMS.

THE ULTIMATE REASON

Oracle has had the first relational DBMS and the first implementation of SQL, back in 1979. Today ORACLE is based on thousands of mainframes, minis and over one-thousand PCs. ORACLE is the only SQL-compatible relational DBMS that's portable across IBM mainframes, DEC, DG, VME and micro computers. ORACLE applications and databases are conceivable across different hardware and software environments. And providing you with a truly distributed solution to your information needs.

Spend half a day at an Oracle seminar in your city, and find out how you can benefit from the power of a relational DB2-compatible relational DBMS... and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write Oracle Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.

SOFTWARE & SERVICES

Graphics standard tool debuts

CGM implementation for DEC VAX to ship

By Rosemary Manillo

AUSTIN, Texas — Nova Graphics International Corp. recently said it plans to begin shipping a software package based on the emerging Computer Graphics Metafile (CGM) standard for Digital Equipment Corp.'s VAX line late this year.

The CGM is currently under review by a committee of the American National Standards Institute (ANSI). It would provide a standard file format in which all graphics files would be stored, transmitted and retrieved.

NovaCGM, which will sell for \$3,500, is an implementation of this emerging standard. Each graphics file created by a user will be encoded in a standard format for storage or transmission.

It will work in conjunction with NovaGKS, the vendor's other software package, which is based on the Graphics Kernel System (GKS), an official ANSI standard. GKS serves as a graphics interface and consists of approximately 200 graphical subroutines that can be used by a programmer.

There are at least two other software products available based on CGM, including the Metafile System from Precision Visuals, Inc.

Mapper gets application kit

From page 19

The kit includes a business problem modeling facility, *Sum*, with which a user may define, specify and analyze the information flow of a particular task, said Michael Shearer, manager of Sperry's Mapper development.

A second component, *Kitbuild*, provides automated documentation of the application design. The documentation formats are standard and match the development stages in the problem modeling process, he said.

Kitbuild also provides a data dictionary for the application and can provide color diagrams of the data

flow, Shearer said.

A third component, *Kitaid*, is intended to allow Mapper end users to maintain their applications through modifications like *adjust*, which allows modifications to fields or processing instructions without disrupting the rest of the application, Shearer said. Any modifications automatically re-sign the documentation and data dictionary, he added.

He added that the structured analysis feature allows users to break their applications down into smaller and smaller pieces as the system provides data consistency.

Changes to applications may lead to maintenance problems because end users cannot be counted on to make changes consistently through 50 or 60 programs, Foster said.

Mapper Kit retails for \$15,000, or \$980 per month on a lease agreement.

M&D promises; users want action

From page 19

meties," Dodge told the 1,750 users at the meeting.

However, conference attendees seemed more concerned about new product deliveries than the company's management team.

"They say they are committed to delivering more products, but they're announcing a reorganization — you have to put more than reorganization into it," said Robert Fournier of Tropigas International Corp. in Coral Gables, Fla.

Instead of news about corporate reorganizations, Fournier said, he wanted news of new products for IBM's System/38 line. Tropigas now uses M&D's General Ledger package for its System/38 and is eager to purchase other accounting packages.

"We went with McCormack & Dodge so that we could offer a total integrated package," he told Computerworld. Without other product offerings, Tropigas will buy from other vendors and integrate the systems themselves, said Tropigas's financial systems analyst Jeffrey Pines.

Although the reorganization calls for changes in the management ranks, users are directly affected by a change in M&D's software support arena.

Under the reorganization plan, which will be phased in during the next year and a half, support account managers will be assigned to customers on a geographical basis and will serve as the single contact point for all system implementations.

For West Coast users like Northrop Corp.'s aircraft division in Hawthorne, Calif., the change is a positive one. "We are getting better support from the Los Angeles office," said Mel Gettlesman, project administrator of the finance systems. But Gettlesman added, "M&D has to start addressing 24-hour support."

Other directions outlined by Dodge and executives at the conference include the company's commitment to provide support for selected products to be used with IBM's DB2 and Cullinet Software, Inc.'s IDMS/R, expanded international efforts, increasing the number of generic financial applications and an emphasis in distributed data processing and technologies like artificial intelligence.



Dictionary for data's data

From page 19

in order to write programs that store data into or retrieve data from it. So, record layouts have been an essential to application documentation since long before the data base notion became possible. Until the mid 1970s, record layout collections were often kept in three-ring binders.

In the early 1970s, commercially available data base management systems tested the idea of centrally shared data records technically feasible. In a few years, it grew evident that the idea would work only if record layouts were automated. If each new application were to take advan-

age of existing data, developers and users both had to know what was out there with more precision than ever before.

Although precision, however, is rare in human affairs. Manually maintained record layouts inevitably contain a few errors, some typographical, others resulting from the copy being slightly out of date. ("Slightly out of date" for record layouts, by the way, is akin to being

"a bit pregnant" or "somewhat dead.")

For stand-alone applications, minor record layout flaws are a nuisance. But they can be tolerated because the developer must be intimately familiar with every aspect of the application anyway — there is no one else.

Data base applications, on the other hand, cannot as easily tolerate even minor errors. Potentially, these

applications offer the promise of reduced development costs. We can take advantage of data already recorded by others. To reap the reward, however, developers must be able to find out, with little effort, what is in the data base. Effort means cost.

If fact-finding demanded detailed examination of the files, the effort would be high, the price paid, the promise broken. In short, minor errors in metadata, a nuisance to stand-alone development, destroy one of the very reasons for building data base applications.

Today's dictionaries offer absolutely accurate essential metadata (item length, format and encoding). It is their unusual history-making achievement. Few events have affected the application-building industry as profoundly as the simple fact that, for the first time, we have record layouts that are truly, really, 100% accurate.

How do they do it? Putting data in a computer does not, of itself, make it any more reliable. Record layouts, automated or not, are simply documentation, when you get down to it. And documentation, despite our best intentions, has low priority. The answer: We put clean documentation in things that threaten us. We shall explore this in a moment. First, we will look at metadata from the user's viewpoint.

Data base users need precise information about their data. In a nutshell, data base means your accounts payable manager agrees to use vendor data recorded by the purchasing department. Agreement hinges on confidence, and confidence depends on knowing the details.

Who in purchasing is responsible for it? How often do they update it? How is it validated? How often do they make mistakes? If I see an error, may I correct it or must I ask purchasing to do so? The questions are as hard to predict as they are important. The answers should be recorded in the dictionary.

The second function of a data dictionary, then, is to store facts about the data. Some of these are irrelevant to DP, are vital to our users.

The challenge to dictionary makers is that, in contrast to DP metadata, you really don't know which questions users consider important until they ask them. Hence, a dictionary should let you define new classes of data about data.

A dictionary's third function is to enable us to record, in one place, facts about a data element that do not vary from one record layout to the next. Employee numbers, say, may appear in the data base's personnel record (as its key), in the department record (identifying the unit manager), in the maintenance work-order record (the engineer responsible) and in many others.

Nevertheless, common sense dictates that, wherever it is used, in whatever program it appears, the employee number must appear as "EMPLOYEE-NUM" nine characters long and not encoded as master.

Consistency of data about data is as important as consistency about anything else. We put vendor address in vendor master records, not in every purchase order. Similarly, data about the abstraction "employee number" should be recorded in a file of data element definitions, not in every record layout in which it appears.

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COMMUNICATIONS



DATA STREAM
Dental Mind

Choice: T1 or channel bank?

One of the success stories in data communications in the past two to three years has been the rise of T1 lines. T1 lines (DS1) facilities that carry data at 1.544 bit/sec. were initially available only for internal use by telephone companies. Around 1980, the telcos began offering leased T1 lines to end-user subscribers as a "specialty engineered facility."

In 1983, T1 services became generally available as tariff offerings from Bell operating companies. Several diversified Bell operating companies now offer a tariffed DS1 service over fiber in certain areas.

T1 multiplexers divide a T1 channel into subchannels that can be routed separately to different destinations. Revenue for this equipment rose from \$30 million in 1983 to an estimated \$150 million in 1986, and the 70% compound growth rate is expected to continue at least until 1990.

Originally, T1 multiplexers were an outgrowth of another type of data equipment, the channel bank. One key question that many MIS and telecommunications managers should be asking themselves is, Should I buy a channel bank or a T1 mux? Here are some facts to consider.

Both T1 muxes and channel banks multiplex multiple lower speed channels into a DS1-range channel. However, channel banks were designed to han-

See CHOICE page 26

Minoli is an adjunct assistant professor with New York University's Information Technology Institute as well as a full-time data communications researcher and strategic planner.

ISDN conformity tests out

Bell Northern facilities open to users, vendors

By Elizabeth Horwitz

OTTAWA — Two testing facilities for determining products' conformance to Integrated Services Digital Network (ISDN) protocols are now being made generally available to vendors and users on a goodwill basis, Bell Northern Research announced last week.

The facilities are based on a Northern Telecom Inc.'s DMS-100 central office switch. Bell Northern's ISDN Test and Traffic Simulator (ISDN-TATS) performs overall testing to verify whether a network meets the emerging industry standard's performance specifications for transmitting voice, data, video and text over the same digital connections, said Cho Lue Wong, director of Bell Northern's ISDN Planning Program.

The CPE Test Facility enables customer-premise equipment (CPE) vendors to test

their products for ISDN conformance "without having to install them on an actual ISDN network," Wong added.

The facilities have been operational since June. Northern Telecom, which owns 70% of Bell Northern, is already using the facilities to test the ISDN compatibility of its central office and customer-premise equipment that will be used in ISDN field trials later this year, Wong said. The facilities have also been available to third-party vendors whose equipment will be used during the trials.

Bell Northern's facilities will be used to prepare CPE that will be used in an ISDN trial being conducted by Northern Telecom and divested Bell operating company Mountain Bell. Scheduled to operate from November to at least May 1987, the trial's ISDN network will connect DMS-100 switches installed on four Mountain Bell central office facilities with customer-premise equipment installed at Mountain Bell and the state of Arizona's departments of Transportation and Administration.

See ISDN page 25

INSIDE

Tridom unveils VSAT satellite-based data communications product/24

PBX 1985 growth figures are misleading, report says/25

IBM offers European users free OSI test/28

NEW THIS WEEK

■ Honeywell introduces its HFMS3000 fiber-optic modem

■ For more on this and other new products, see pp. 73-88.

INSTANT ANALYSIS

"Telex vendors need to join the Electronic Data Interchange market rather than fight the tide; sending documents directly from computer to computer is a lot faster and more reliable than rekeying a Telex into the system." — Morton Ganzfried, consultant to ITT Worldwide

PCs access mainframe graphics

By Alan Alper

NORCROSS, Ga. — Four graphics terminal emulation boards recently introduced by Digital Communications Associates, Inc. (DCA) provide IBM Personal Computers and compatibles with the ability to generate mainframe graphics while operating an IBM 3270 terminal.

The firm also unveiled a hardware and software package that provides IBM Personal Computers and compatibles with the multiwindowing, multisession functionality of an IBM 3270 Personal Computer workstation.

The products enable PC users to generate high-resolution, presentation-quality graphics in terminal mode, then store them on a disk or send them to a plotter for hard-copy generation, DCA claimed. They eliminate the need for both a graphics terminal and PC on a user's desk, said DCA Marketing Vice-President John C. Bacon.

Each of the products works in conjunc-

tion with Graphical Data Display Manager (GDDM), IBM software for creating mainframe graphics on 3270 graphics terminals. They are compatible with an assortment of mainframe-based graphics applications packages, including IBM's Interactive Chart Utility and third-party products like Inseco's Tell-A-Graf and S&S Institute, Inc.'s SAS/Graph, DCA said.

Environments supported by the graphics boards include IBM Systems Network Architecture (SNA) and asynchronous, local, remote and stand-alone modes in which Control Unit Terminal or Distributed Function Terminal technology is used. Ima 3270 Graphics, an IBM 3270 emulation board, gives PCs and compatibles with 3270 SSG Programmed Symbol mainframe color graphics in any IBM environment.

The board also provides the same terminal emulation and file transfer capabilities as DCA's Ima terminal emulation board.

See PC page 24

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Tridom aims fault-tolerant VSAT system at financial firms

Claims cost reductions over leased-line nets

By Stanley Shees

ATLANTA — Tridom Corp. recently announced Clearlink, a very small aperture terminal (VSAT) satellite system with fault-tolerant features aimed primarily at financial service companies.

The system was designed to reduce costs 30% to 60% for two-way networks, compared with the cost of leased lines, according to Tridom.

Howard Lukens, Tridom marketing manager, said the system has been well received by brokerage

houses and insurance firms for use in their interactive networks for such tasks as buying or selling stocks, bonds and broadcasting financial information. Banks have also found the system useful in transmitting branch data to data center transactions, he said.

"I think the financial industry is fertile ground," offered John McQuillan, president of McQuillan Consulting in Cambridge, Mass. "The retail industry was the first to really go VSAT. The financial industry is second," he added.

The Clearlink network is composed of 1.2-meter dishes located at the customer's branch offices and communications over a Ku-band sat-

ellite to a shared master hub station that is connected by leased lines to the customer's host computer.

Network control and diagnostics are handled by a fault-tolerant computer at the hub station. A customer can be in constant touch with the hub's network control computer through a terminal on his premises.

Fail-safe feature

According to Tridom, a fail-safe feature is also available that automatically dials the closest earth station or the hub through a built-in modem, should a remote station cease to function.

Clearlink supports Synchronous Data Link Control, bisynchronous

and asynchronous communications protocols. A link-level communications protocol is used to ensure complete end-to-end data integrity, the manufacturer said.

Clearlink can also concurrently run several applications, including interactive data, broadcast data services, data upload or download, video teleconferencing and certain broadcast voice applications, such as the brokerage industry's "hoot and holler," in which a person on the trading floor of the stock exchange transmits information about trading prices one-way to a number of brokers.

Priced at \$7,500 per site, the system will be available this month.

PC gets graphics from mainframe

From page 23

It is available in two versions: one board combining graphics and DCA's Irma board terminal emulation functionality lists for \$1,995, while the upgrade for use with an existing Irma board costs \$1,195. Both will be available in September.

The Irma All Points Addressable Graphics board provides graphics to PCs and compatibles within a distributed function terminal configuration controller environment. It allows host graphics to be stored and printed locally and supports Virtual Device Interface/Computer Graphics Interface-compatible software.

The complete product sells for \$1,695. An upgrade board for existing DCA terminal emulation boards Irma or Forte PJ lists for \$795. Both will be available in October.

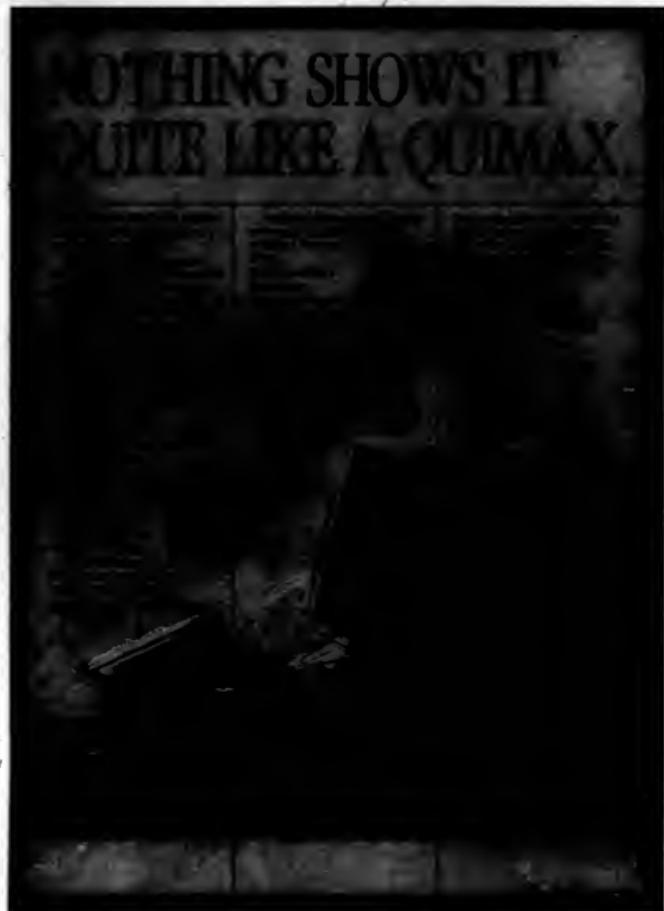
DCA also brought out Irma PS Graphics, a release of its Irma Graphics board that offers three additional enhancements: file transfer capabilities, bisynchronous compatibility and light pen support.

Irma PS Graphics lists for \$1,595. An Irma board upgrade can be purchased for \$795. Both versions will be available in October.

In addition, DCA unveiled a board that provides APA graphics capabilities for remote PCs via controller emulation. Called Irmacon APA Graphics, the board emulates an IBM 3274 controller and a 3270 display, offering remote PCs in an SNA environment the same functionality that Irma APA Graphics provides to local PCs. Available in October, Irmacon APA Graphics lists for \$1,295, DCA said.

Another DCA introduction, Irma Multisessions, provides the IBM PC family and compatibles with Distributed Function Terminal multisession capabilities. The enhanced graphics feature of the 3270-PC PCs equipped with Irma Multisessions can simultaneously display one PC-DOS session, two notepads and up to four host applications.

Irma Multisessions is available as a complete package including expansion board and software for \$1,495 or as an upgrade to an existing Irma or Forte PJ terminal emulation board for \$895. Both versions will be available in October.



COMMUNICATIONS

Line shipments peak, but PBX demand expected to subside

Present plateau due to add-ons, conversions

By Elizabeth Horwitt

NEW YORK — Despite a 12.6% surge in line shipments in 1985, private branch exchanges (PBXs) are suffering from overall demand decline that should continue through 1990, according to a recent PBX market report by Northern Business Information, Inc.

The New York research firm attributes increased line shipments to a "higher number of add-on shipments in 1985 and larger average system sizes," pointing out that the number of new system shipments in 1985 was 3.4% lower than 1984 levels.

"PBX line shipments will peak in 1987. I doubt systems will go up at all this year," says Northern Business senior analyst William Rich, adding that the most recent spurt of PBX sales was fueled by companies converting from analog to digital PBX systems. The majority of companies will have completed conversion by 1987, according to the report.

Northern Business's report predicts that by 1990, 91.3% of the installed PBX base will be digital, and PBX sales will have declined to less than \$3 billion (see chart). "The next

big increase in sales should come in the 1990s, when the average digital system will be eight to twelve years old and ripe for replacement," Rich says.

The market slowdown is aggravating an industry shakeout that has threatened the smaller suppliers, the report says. Top players are AT&T, Northern Telecom, Inc.,holm Corp./IBM, Mitel Corp. and NEC America, Inc. expanded their total market share from 71% in 1984 to 75% in 1985, Northern Business says.

"With the erosion of the analog base, many of the second- and third-tier PBX suppliers will disappear," Rich says. "The market simply will not support them," the report predicts.

Survival in the shakeout depends most on having a large installed base

of digital systems that constitute an aftermarket for add-on equipment such as peripherals, new sets of terminals, Rich notes.

"Large suppliers like AT&T that offer a wide range of net equipment will do well. If you only have a switch and nothing to sell with it, you're caught out," AT&T, Northern Telecom andholm have tightly controlled distribution, so "they'll know where to market their equipment."

However, AT&T has an extensive analog base that is "still open to attack from competitors," Rich says. "We think they might push into Digital Networks to ward this off."

grated Services (ISDN) connectivity to ward this off. AT&T Communications can start sending business traffic on a D chan-

nel. For instance, AT&T is thinking of using the D channel to transmit call-screening information of value to telemarketers and commands that would automatically call up the caller's account file on the user's screen.

By pushing the entire PBX industry toward adoption of ISDN standards, AT&T would maximize all current PBX systems, including its own, Rich says. "But AT&T is ahead of most vendors in converting its customer-premises equipment to ISDN, which would give them at least a temporary advantage over other companies like Northern Telecom."

The same five years that see continued PBX sales decline will also be a growth period for PBX-related products such as integrated voice/data terminals, data PBXs, local-area networks, modems, multiplexers, protocol converters and packet-switches, the research firm predicts. This market will climb to \$8.6 billion by 1990, growing at a compound rate of 27.5% per year, the report states.

As PBX vendors focus on the PBX aftermarket, they will concentrate on major distribution channels such as Centel Business Systems and the seven regional holding companies, including away from independent telephone companies and "Mom and Pop" supply houses, Rich says.

IBM offers European users free OSI testing to verify implementations

By John Lamb
CW Communications International News Service

NICE, France — IBM users will soon be able to check their implementations of the International Standards Organization's Open Systems Interconnect (OSI) standards with IBM's version of the same OSI function. In October, IBM will launch a verification program in Nice that will allow users to dial up and put their communications software through its

paces with IBM's.

The service, free to European users, will be accessed via public packet-switched networks, and candidates must provide their own applications test software.

Last year, IBM launched development software called the Open Systems Transport and Session Support designed to allow users to develop OSI software for Layers 4 and 5 on the OSI model.

multivendor interoperability with their "Open World" concept, it would be strange, and dangerous, not to extend that openness to ISDN equipment. AT&T has a similar facility for testing ISDN compatibility with its 5ESS digital switch," she said.

Lehto pointed out, however, that different vendors' central office switches still cannot communicate on the same ISDN network.

"It's critical that the central office switch vendors like AT&T and Northern Telecom work cooperatively. [CPE interface chip vendor] Intel Corp. said to me, 'People all say yes to ISDN standards, but each company interprets it differently,'" Lehto said.

"There is no guarantee that an ISDN-compatible terminal will communicate with different vendors' switches, because ISDN is not firm yet," Wong said. "Too many pieces of the protocol are still left open for definition." He estimated that true ISDN compatibility among different switches would take place by 1988 or 1989.

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COMMUNICATIONS

Choice: T1 or channel bank?

From page 23

the analog voice transmissions, while T1 muxes primarily handle digital data transmissions.

Because a channel bank's standard input rate is 64K bit/sec., it typically cannot divide a T1 channel into more than 24 subchannels.

In contrast, a T1 mux can subdivide a T1 channel into 96 6.6K bit/sec. circuits or even 200 low-speed data channels supporting 4.8K bit/sec. or even 2.4K bit/sec. subrates.

It also accepts supernorms — generally up to 768K bit/sec. for compressed video transmission. Some vendors refer to this as dynamic bandwidth allocation.

T1 muxes are also more flexible in their management of available bandwidth, of-

ten allowing for software-based reconfiguring of channel allocation.

Channel bank limitations

Channel banks have limited data-carrying capabilities. They can, with difficulty, handle 9.6K bit/sec. rates transmitted by the appropriate modems, but cannot directly handle data rates at 56K bit/sec. or 64K bit/sec., except via a Datapac or Digital Service connection.

Linking a digital communica-

tions device such as an IBM 3725 front-end processor to a channel bank is arduous at best. First the transmission must be converted from digital to analog by a modem. Then the channel bank converts it again to a different digital stream, to be placed on a T1 line. The reverse process takes place at the receiving end.

The fact that a channel bank cannot divide a T1 link into more than 24 subchannels can also result in ineffi-

cient handling of multiple data circuits. It would take eight channel bank termination devices (four on each end of the link) and four T1 lines to transmit 96 6.6K bit/sec. data streams from point A to point B. Each T1 line would carry 24 channels, each capable of transmitting 64K bit/sec. but actually carrying only 9.6K bit/sec.

In contrast, it would only take two T1 muxes and one T1 link subdivided into 96 fully utilized channels to carry the same 96 6.6K bit/sec. data streams.

On the other hand, channel banks are more suitable for T1 links moving voice calls — for example, the links between PBXs. Designers of T1 mux equipment are starting to include voice cards that handle 32K bit/sec. voice transmission. The quality is acceptable but not always standard-toll quality. Among the vendors that provide such products are Timplex, Inc., Aydin Corp., Datatel, Inc. and Comstom.

Protocol criterion

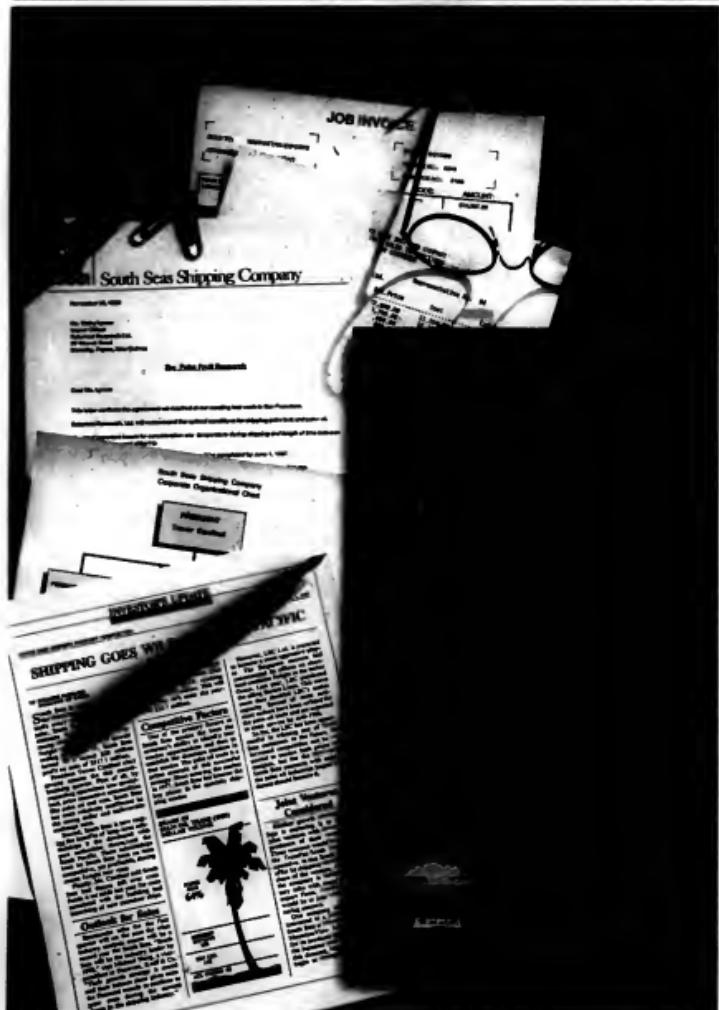
Another important advantage in T1 equipment is the integration of data and voice channels on the same T1 link. An important criterion, however, is whether the vendor uses D4 byte-interleaving protocols that are compatible with AT&T Communications' Digital Access and Synchronization System (DACS) and Customer Controlled Reconfiguration. These protocols enable customers to switch individual 64K bit/sec. channels from one T1 channel to another.

Some vendors use their own proprietary signaling protocols, thus preventing customers from linking their T1 networks with networks based on other vendors' T1 equipment. Other vendors use bit-interleaving protocols that allow for additional capabilities — such as supporting 200 or more channels on one T1 link — but are not compatible with DACS.

Customers who use this type of system will not be able to terminate their DS1 channels at local or long-distance carriers' central offices.

Telecommunications managers shopping for T1 equipment should keep all of the above considerations in mind. They should also think about the future, when carriers have successfully adopted Integrated Services Digital Network standards.

Some T1 vendors claim that their equipment will easily migrate to the new standard. Prospective customers should ask for details on what this will really mean to their companies: an inexpensive upgrade, a massive overhaul or replacing their current T1 equipment, which is an expensive and painful process.



SYSTEMS & PERIPHERALS



HARD TALK

James Connolly

Early delivery is simple math

It should not have been surprising that IBM advanced the delivery schedule for the latest star of its large systems product line, the four-processor 3090 Model 400.

After all, the Model 400 is essentially a merger of two 3090 Model 200s. IBM left itself plenty of leeway in setting the delivery schedule, originally allowing 26 months to ship the quadratic version when the dual-processor Model 200 was due for delivery in only nine months. That gave IBM almost a year and a half to merge the hardware and software of two dual-processor boxes. So the original second-quarter 1987 delivery date was changed in February to fourth-quarter 1988.

To the delight of some customers who were desperate for power, the new date quietly was shifted, and the Model 400s left IBM in August.

One has to wonder, however, if the schedule advances are, as IBM says, the result of Model 400 development progressing faster than expected or even, as IBM would like users to think, if the company wanted to give loyal customers as much power as possible. A skeptic might wonder whether the early shipments were related to National Advanced Systems Corp. and Amdahl Corp. recently installing their 3090 rigs.

But it is more likely that Model 400 deliveries began in August are the result of that month's falling during the third quarter of IBM's 1986 fiscal calendar. It is unfortunate — although

See EARLY page 30

Connolly is Computerworld's senior editor, systems & peripherals.

HP mini boasts power gain

Mid-range 3000 Series 52 provides upgrade path for Series 42 customers

By James Connolly

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced a mid-range business system designed to provide a 30% performance boost and four times more memory than its earlier HP 3000 Series 42 minicomputer.

The new HP 3000 Series 52 reportedly uses the same processor as HP's next, more powerful machine, the HP 3000 Series 58, rather than the reduced instruction set computing-based architecture of the high-end HP 3000 family of machines introduced earlier this year.

According to Douglas C. Spreng, general manager of HP's Computer Systems Division, the Series 52 supports up to 92 personal computer users or terminal users while running HP's Personal Productivity Center and Advantech software.

"The new system is a cost-efficient alternative for companies that would like improved performance for their applications. These companies need to know that a growth path exists, even though they may not currently need support for more than 100 users that the larger Series 58 provides," Spreng said.

The Series 52 reportedly can work as a node in a distributed data processing network or in a stand-alone business environment.

The system is said to support 4M to 8M bytes of memory and a 32K-byte cache memory. It runs HP's MPE operating system and Turbomage data base management system and was designed to be compatible with all other members of the HP 3000 family.

Among the peripherals that are supported are eight disk drives ranging from 28M bytes to 404M bytes for a maximum of 3.2G bytes, four tape drives and four line printers or eight serial printers.

An HP 3000 Series 52 with 4M bytes of memory, two I/O channels and operating system costs \$45,000.

Micro, Unix markets top shortcomings DEC must face in future, analysts say

By Donna Raimondi

NEW YORK — Although it has been out-pacing the rest of the computer industry in sales, Digital Equipment Corp. faces substantial obstacles it must overcome, analysts said at a recent conference.

DEC's so-called hidden assets — sophisticated users who have helped produce an extensive software library — are no longer the company's prime customers, according to analysts who spoke to 325 attendees at a briefing in New York last week sponsored by the Boston-based Yankee Group. The company's hidden assets, however, which helped to propel the minicomputer vendor to prominence as the world's second-largest computer company, has been expanded to include customers who rely on vendor-developed software.

Market conditions have changed since

DEC's early days. The minicomputer market is mature, hardware is almost a commodity market and many of the customers DEC needs to serve are not its traditional technical users, the analysts said.

"The real growth is in workstations now, where DEC has failed," said Howard Anderson, managing director of the Yankee Group. "The minicomputer market is \$3 billion — larger than DEC — and Ken Olsen takes the blame for DEC's weakness here." According to Anderson, current advantages in networking and clustering concepts are temporary, with other vendors poised to catch up in the next year or so.

Part of DEC's strategy for the next few years includes introducing more versions of its successful Microvax II system.

See DEC page 31

INSIDE

HP workstation bows at Siggraph conference/30

National Archives urged not to store records on optical disks/31

NEW THIS WEEK

Talaris Systems combines alphanumeric and graphics on 7800 terminal

Kentek Information Systems offers 12 page/min. printer

■ For more on these and other new products, see pp. 73-88.

INSTANT ANALYSIS

"By this time next year, DEC could release a quad-processor, 20-MIPS machine. If IBM were to release a 20-MIPS System/38, it would be competing against its own 3090s."

— Marc Schulman, analyst and vice-president, Salomon Brothers, Inc., speaking at an August briefing session on Digital Equipment Corp.

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HP, others unveil engineering workstations at Siggraph

Model 320SRX offers faster image modeling

By Rosemary Hamilton

DALLAS — A number of new models and performance boosts were introduced by engineering workstation vendors at the annual Siggraph trade show and conference held in Dallas recently.

Hewlett-Packard Co. unveiled an addition to its 9000 line of technical workstations. The Model 320SRX, designed for solids modeling, has a starting price of \$45,800.

Based on custom very large-scale integration chips, the 320SRX incorporates graphics instructions into the microcode and hardware, thus allowing for solid images to be rendered at a speed 20 to 30 times faster than that of other workstations in a similar price range, according to the vendor.

The system, which is expected to ship within two months of order, comes with 4M bytes of main memory, an I/O expander; the HP high-speed Interface Bus and LAN; the HP-UX operating system with a graphics library, a 1,280- by 1,024-pixel resolution monitor, eight planes of frame-buffer memory and four overlay planes.

The 320SRX's operating system is based on the AT&T System V version of Unix.

Model upgrades

Upgrades from other 300 models in the 9000 series are available. If a Model 320 user were to add the 320SRX display controller and the

HP-UX operating system with the graphics library, it would cost \$12,440.

A \$10,000 graphics accelerator, a \$1,300 power supply and eight planes of additional memory at a cost of \$4,500 are also available. Silicon Graphics, Inc. introduced an enhanced proprietary graphics processor, the 10-MHz Geometry Engine, that it claims offers a 25% to 30% performance boost over the current Geometry Engine used in its Series 3000 workstations. The enhanced processor will be offered as a \$6,000 option for new systems or as a \$7,000 upgrade kit to the company's installed base.

The Geometry Engine, which func-

tions as a separate processor from the CPU, reportedly enables the system to manipulate three-dimensional wire-frame and solid models in real time.

The vendor also said it has formed a subsystems group that will sell board- and chip-level products based on its Geometry Engine to OEMs.

Excalibur workstation

Saber Technology Corp. introduced its top-of-the-line Excalibur workstation, the Model 3080, which is based on the National Semiconductor Corp. 32020 microprocessor. The system, with a starting price of \$71,300, will be targeted at graphics-intensive applications such as molec-

ular modeling, medical imaging and seismic analysis.

An entry-level system comes with 4M bytes of main memory, expandable to 12M bytes, an 85M-byte disk drive expandable to 350M bytes and a 19-in. monitor that can display up to 1,096 colors simultaneously.

Japan Computer International, the U.S. subsidiary of the Tokyo-based Japan Computer Corp., announced its G5068 color graphics workstation, which it plans to sell to OEMs. The Motorola, Inc. 68020-based system can be used for either two-dimensional or three-dimensional applications and can be switched to either a 16-bit or a 32-bit mode, according to the vendor. The starting price is \$39,950.



Early delivery is simple math

From page 29

surprising to only the most naive — that IBM pretends to have rushed the Model 400 out the door to address its customers' needs.

But in the world of business, the need for revenue can be a legitimate, or at least an arguably legitimate, reason for almost any action. If IBM was not stuck in the doldrums, the Model 400s would have been sitting in IBM's Kingston, N.Y., factory until the flowers bloomed next spring. The Model 400 does mean revenue for IBM, even if the system does not sell as well as expected and even if moving what could have been 1987 sales into the third quarter of 1986 hurts 1987's results.

If IBM can deliver and record as third-quarter sales even a dozen of the roughly \$10 million Model 400 upgrade packages, that translates into \$48 million revenue in simple math, almost \$20 million in profits if one uses less simple math to calculate the profits on a mainframe at 40%, as some IBM analysts have done.

So, once again the almighty buck rules. But at least this time, someone besides IBM — like the users who could not understand the reason for the original 26-month lead time — might profit.

National Archives' storage under scrutiny

Study deems tapes, disks to be unsuitable

By Mitch Batts

WASHINGTON, D.C. — The prestigious National Research Council has issued a report urging the National Archives not to use magnetic media or optical disks to permanently store historical documents.

Optical disks and magnetic media last only 10 to 20 years for archival purposes, and the rapid pace of change in hardware and software technology suggests that it may be impossible to read the historical records in the centuries to come, accord-

ing to the report, "Preservation of Historical Records."

William Holmes, director of the National Archives and Records Administration's archival research and evaluation staff, stated that he agrees with the research report's conclusions.

He said that although the agency plans a pilot test of digital imaging and optical-disk technology [CW, April 14], optical disks will be used only for public retrieval and not for permanent storage.

"Even if the operating systems and documentation problems some are dealt with, what is the archivist to do when the machine manufacturer declares the hardware

obsolete or simply goes out of business?" the research report asked. "Will there be an IBM or a Sony in the year 2200? If they still exist, will they maintain a 1980-1990 vintage machine?" the report continued.

An example of this problem occurred in the mid-1970s when archivists discovered that there were only two computers that could read the 1960 U.S. census; one was in the Smithsonian Institution and the other was in Japan [CW, Sept. 23, 1985].

The inescapable conclusion, the researchers said, is that long-term archivists would be committed to an expensive file conversion program every 10 to 20 years if it uses electronic media for permanent storage.

DEC must meet mart challenges

From page 29

"There could be a 2.6-million-instructions-per-second Microvax II by fourth-quarter '87," said William Rosenberger, vice-president of communications and information systems at Yankee.

DEC will announce a Microvax clustering capability by fourth-quarter '86, but it will not enable Microvax owners to link up to the main Vaxcluster, Rosenberger said. DEC appears to be working on a quad-processor, 20-MIPS machine based on its current VAX 8800, which could be available in 12 to 18 months, Rosenberger added.

Right now, DEC is benefiting from a fallout in the industry, Anderson said. Its major competitors — Data General Corp., Wang Laboratories, Inc. and Hewlett-Packard Co. — have squandered early advantages. But

"It requires at least two people to support any one operating system, so we like that VMS runs on all the VAXs."

— Steven Gokorski,
General Electric Co.'s
Lighting Business Group

while DEC has the temporary advantage, those competitors will be able to overcome their problems and will have to be reckoned with again, he predicted.

DEC should strengthen its data base management system offerings and must take Unix seriously, said Laura Stewart, Yankee's managing director of corporate planning. "DEC has allowed Sun Microsystems, Inc. to take the Unix market lead, and HP could begin to ride the Unix tide in factory markets," she added.

Mark Schulman, senior technology analyst at New York's Salomon Brothers, Inc., said DEC is becoming increasingly healthy financially — a factor that counts when corporations decide whose products to buy. For instance, in the June quarter, DEC had a 35% to 40% year-to-year increase in orders and a gross margin higher than any quarter in 14 years.

One reason for DEC's success is tied to its ability to provide services "from the desktop to the data center," said Steven Gokorski, manager of electronic services at General Electric Co.'s Lighting Business Group in Cleveland, Ohio. That IBM mainframe installation also runs a system of four clustered VAXs (two 8600s and two 11/7854) plus 46 other VAXs for scientific, engineering and office applications. "It requires at least two people to support any one operating system, so we like that VMS runs on all the VAXs," he said.

Gokorski called on DEC to improve its data storage devices. "The tape handlers could be more reliable," he said. He also wants DEC to recognize his telephone needs. "We think voice and data will come together, and DEC hasn't addressed that yet," he said.

TI's new OmniLaser page printer can turn your PC into a desktop publishing system.



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capabilities, including rotated type, textures, patterns, halftones, images in any size and shape, and a wide variety of typefaces. Each font has one definition that is used as the basis for any point size. You have complete control over the size and positioning of your text and graphics. PostScript also has built-in commands for font specification, circular arcs, curves, etc. You can perfect your text and graphics on your OmniLaser and PC, and then take your original to a high-quality production facility and skip all the headaches of mechanical assembly. Whether you're composing newsletters, product data bulletins, ad proofs, business presentations, technical manuals, or any type of document, you'll find that with the power of PostScript, you are only limited by your imagination.

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The OmniLaser uses the direct post-imaging exposure process as opposed to the reverse-exposure process used by many other laser printers. The difference, as shown above, is obvious.

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MICROCOMPUTERS



MICRO BITS

Willem Zachmann

Hardcard is not so hard

I don't know about you, but I still get nervous any time I uncrew the cover on my personal computer to try out the hardware. There are just so many things that can go wrong. The new accessory board may turn out to want an interrupt already in use. One of the ribbon cables climbing over the boards may get pinched when I open the case back on, causing it to short out. I might drop a screw and then scratch a connection on the system board when clumsy fishing it out with a screwdriver.

Nothing terrifies me more, however, than installing a new hard disk. The potential for error or failure, the complications and the dangers are just too numerous. It's not just the physical business of getting the thing in right, either. Sorting out the software has also been quite a task in the past. Being a veteran of a number of hard disk installations, I am always prepared for the worst.

All of this made my experience with the Plus Hardcard 20 by Plus Development Corp., the much more of a pleasure. A crystal-clear "Installation and Reference Manual" combined with an extremely simple and straightforward installation procedure made the difficulties I encountered with hard disks in the past seem like distant memories.

In the first place, the Plus Hardcard 20 is a very elegantly designed 20M-byte Winchester disk and controller mounted on a card that fits into any standard IBM Personal Computer or

See HARDCARD page 36

Zachmann is vice-president of research at International Data Corp.

Bad chip hampers AT clone

Televideo resolves error, but too late for one user

By David Bright

An improper chip in approximately 200 Televideo Systems, Inc. IBM Personal Computer AT compatibles has caused intermittent problems for some users and a major headache for at least one user, Computerworld has learned. According to Televideo, most of the Telecat-286 systems containing the bad chip have been tracked down and repaired.

The \$2,995 Telecat-286 was introduced in late April. During the following two months, more than 5,000 of the systems were shipped, said Ron Nakashima, director of systems product marketing.

According to Nakashima, the motherboards on as many as 200 of the early Telecat-286 systems had been outfitted with the wrong version of a memory chip mistakenly supplied by Motorola, Inc.

The CMOS static random-access memory (RAM) chip contains system setup information, such as the type of hard disk drive and the number of disk drives. In certain cases, Nakashima said, that information was lost, leaving the systems unable to be booted from the hard disk drives. He said the problem can be corrected simply by replacing the offending chip with an upgraded version.

An undetermined number of the upgraded grades were made in Televideo's warehouse before the systems were shipped, according to Nakashima. As for the rest of the defective systems that might have been shipped, Nakashima said distributors have been aware of the potential problem for as long as a month, but he was unsure exactly how many upgrades had been made so far.

"It's a massive failure type of thing," Nakashima stressed. "The system is still useable. It just becomes intermittent in the initial setup information is lost. You can also always revert back to the system boot diskette."

Nakashima claimed that most of the reported problems concerning the bad chip occurred when users failed to turn on the battery switch, which holds information in the CMOS RAM chip when the system is brought down.

"It's one of those intermittent things. That's why, when we first released the product, we had difficulty in finding out what the problem was or whether there actually was a problem," he said.

One early user who was acutely aware of a problem was Cynthia Lettich, DTP manager at Hughes Lumber Co. in Tulsa, Okla. After reading favorable reviews about the system's price/performance ratio, Lettich purchased a Telecat-286 June 27 for about \$2,000 less than the cost of a comparably

See CHIP page 38

Easylan tool transfers data direct from 5½- to 3½-in. floppy disks

SUNNYVALE, Calif. — Server Technology, Inc. recently announced a utility to its Easylan local-area network (LAN) software that allows direct data transfer of files between 5½-in. and 3½-in. floppy disk drives, such as those used in IBM's PC Convertible laptop microcomputer.

The utility eliminates the necessity of adding a 3½-in. floppy disk drive to the LAN in order to allow users of systems that use the smaller disks to exchange files

or share printers or other peripherals. The user also does not need to convert file formats.

Easylan will support up to 18 IBM Personal Computers or compatibles, Personal Computer XTs, ATs or PCjr systems.

This latest version of Easylan is available immediately in a starter kit that includes a 3½-in. program disk, a manual and a 30-ft. modem cable for \$189.95.

Current users may upgrade for \$119.95.

Sperry micros enhanced with printer, high-resolution graphics

Laser printer targets office environment

BLUE BELL, Pa. — Sperry Corp. recently announced enhancements for its Personal Computer/IT and PC/HT systems, including a 10-page/min. laser printer, a high-resolution controller, an enhanced color graphics monitor, two high-capacity fixed disk drives and a terminal emulation security option.

According to Sperry, the Model 37 laser printer's speed, compact size, flexibility and quiet operation make the machine a good choice for both multiuser and single-user office environments.

The \$3,500 printer reportedly works with almost any software

package. The unit emulates the Sperry Model 51, the Epson America Corp. FX-80, the IBM Personal Computer Graphics Printer, Qume Corp.'s Sprint 11, Hewlett-Packard Co.'s LaserJet, the Diablo Systems, Inc. 630 and NEC Corp.'s Splawriter 3550 printers.

Spikes up to 63 feet

Offering 300- by 300-pixel resolution, the Model 37 stores as many as 61 fonts in read-only memory and includes 1 MB byte of random-access memory as well as support of multiple character sets.

Citing an industry movement toward high-resolution graphics for scientific and engineering applications, Sperry introduced the controller and monitor with support for IBM's Enhanced Graphics Adapter

(EGA) standard.

In addition to EGA compatibility, Sperry's Enhanced Graphics Controller also provides IBM Color Graphics Adapter compatibility and monochrome display ability.

Controller resolution

Priced at \$624, the controller supports 640- by 350-pixel resolution in both color and monochrome and 720- by 480-pixel monochrome resolution when emulating the Hercules Computer Technology, Inc. Hercules Card. The controller includes a 266K-byte display buffer.

The 14-in., dual-pitch Enhanced Graphics Monitor displays 16 of 64 possible colors in 640- by 350-pixel resolution. The monitor is priced at \$849.

Designed specifically for the Sperry

PC/IT, the two full-height, 5½-in. drives feature formatted capacities of 60M bytes and 117M bytes. Average access time for both drives is 30 msec.

A PC/IT system can now be configured with any two of the three available drives — including a 40M-byte model — for a maximum capacity of 234M bytes. The 60M-byte drive is priced at \$2,450; the 117M-byte drive lists for \$5,495.

Sperry also announced a security feature for its Step terminal emulation package for connecting the company's personal computer to its Series 1100 mainframes. A \$500 expansion card provides a connector containing preset user identification codes.

All of these products are available now.

INSIDE

Santa Clara Systems announces mass storage, RAM disk system

NEW THIS WEEK

■ NEC America offers software for its voice recognition plug-in board for PCs

■ For more on this and other new products, see pp. 73-85.

INSTANT ANALYSIS

"Say we come out with a new DOS. It's not like everybody is going to go out and buy it overnight."

— Bill Gates, chairman of Microsoft Corp.

MICROCOMPUTERS

Hardcard is not so hard

From page 35

compatible long-expansion slot. It is engineered very well, using an ultra-thin 3½-in. Winchester drive that actually lets it fit next to another long card. Most card-mounted hard disks are wider and overlap into the space of an adjacent expansion slot.

Physical installation is a snap. There is one jumper on the card that must be set either to a "PC" or an "XT" position. This sets the BIOS address, port address and controller number used in the computer interface to that of an IBM PC or Personal Computer XT. Then you simply slide it into any long slot and put the

cover back on. Running a very simple install program then gets you up and running. I can't imagine a hard-disk installation being simpler or easier.

A Hardcard Directory program comes with the Plus Hardcard 20. It lets you select programs from a menu list and format the DOS screen if you wish and includes a screen-saver feature. That turns the display off after five minutes to save the screen phosphor. It turns back on again with the first keystroke.

A small manual entitled, "Installing Application Software onto Hardcard" provides a step-by-step guide to installing popular products such as Dbase III by Ashton-Tate and Lotus Development Corp.'s 1-2-3 on the Plus Hardcard 20 so as to use the Hardcard Directory. If you don't use the Hardcard Directory, of course, standard installation procedures are

all that are required.

Unlike some of the earlier hard-card add-ons for the IBM PC, the Plus Hardcard 20 makes it possible to boot from the hard disk. It has not run, however, with the earliest version of the IBM PC BIOS with read-only memory. Older systems (generally prior to 1985) may require a BIOS upgrade for use with the Plus Hardcard 20.

Additional software includes Light and Sound. These optionally display a "+" character on the upper right corner of your screen or make a sound when the Plus Hardcard 20 is accessed. They provide a functional equivalent of the LED that lights up on a front-mounted hard disk when it is accessed.

My own preference is actually to skip the software that comes with the Plus Hardcard 20, format it with

a standard Microsoft Corp. MS-DOS FORMAT /S /V command and go. That works fine on standard, fully compatible systems.

Another program provided by Plus, HFORMAT.COM, is set up by the install program on startup with version 2.0 of DOS. Using the HFORMAT command requires special patching to work with the Plus Hardcard 20.

More than just being easy to install and use, however, the Plus Hardcard 20 is also fast. With an average access time of 49 msec., it is a lot faster than the old IBM XT drives and nearly as fast as the 20M-byte Winchester on the IBM PC AT. Programs that require a lot of disk access — data base management systems, for example — will run significantly faster on older hard disks, which typically have average access times in the range of 65 to 85 msec.

Another very nice aspect of the Plus Hardcard 20 is a patented feature that automatically retracts the read/write head to a landing zone and locks it in place when the system is powered down.

99

Another very nice aspect is a patented feature that automatically retracts the read/write head to a landing zone and locks it in place when the system is powered down.

and locks it in place when the system is powered down. This minimizes the chance for vibration damage and loss of data if the system is moved.

On many hard disks, this needs to be done explicitly with a utility program for that purpose. This feature makes the Plus Hardcard 20 especially useful on portable systems.

The Plus Hardcard 20 is explicitly stated to work with the IBM PC, IBM PC XT and IBM 3270 Personal Computer; the Compaq Portable and Deskpro from Compaq Computer Corp.; the AT&T Personal Computer 6300 (dual-floppy and 10M-byte versions only); and the Olivetti Corp. PC M24 (dual-floppy and 10M-byte versions only). It will also work with a number of other compatible systems.

The Plus Hardcard 20 carries a suggested list price of \$895. An older product, the Hardcard 10, pioneered the hard disk on a card and carries a suggested price tag of \$695 with a 10M-byte, 65-msec. drive.

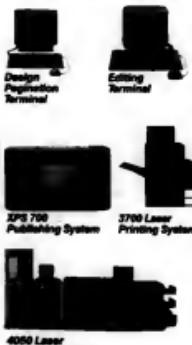
Both offer a very good way to get more value out of older floppy disk systems.

CORRECTIONS

General Computer Corp. of Cambridge, Mass., will not continue to sell its Hyperdrive hard disk for the Apple Computer, Inc. Macintosh through dealers who are no longer authorized to sell Apple products [CW, June 21]. One requirement to be a General Computer dealer is to also be an authorized Apple dealer.



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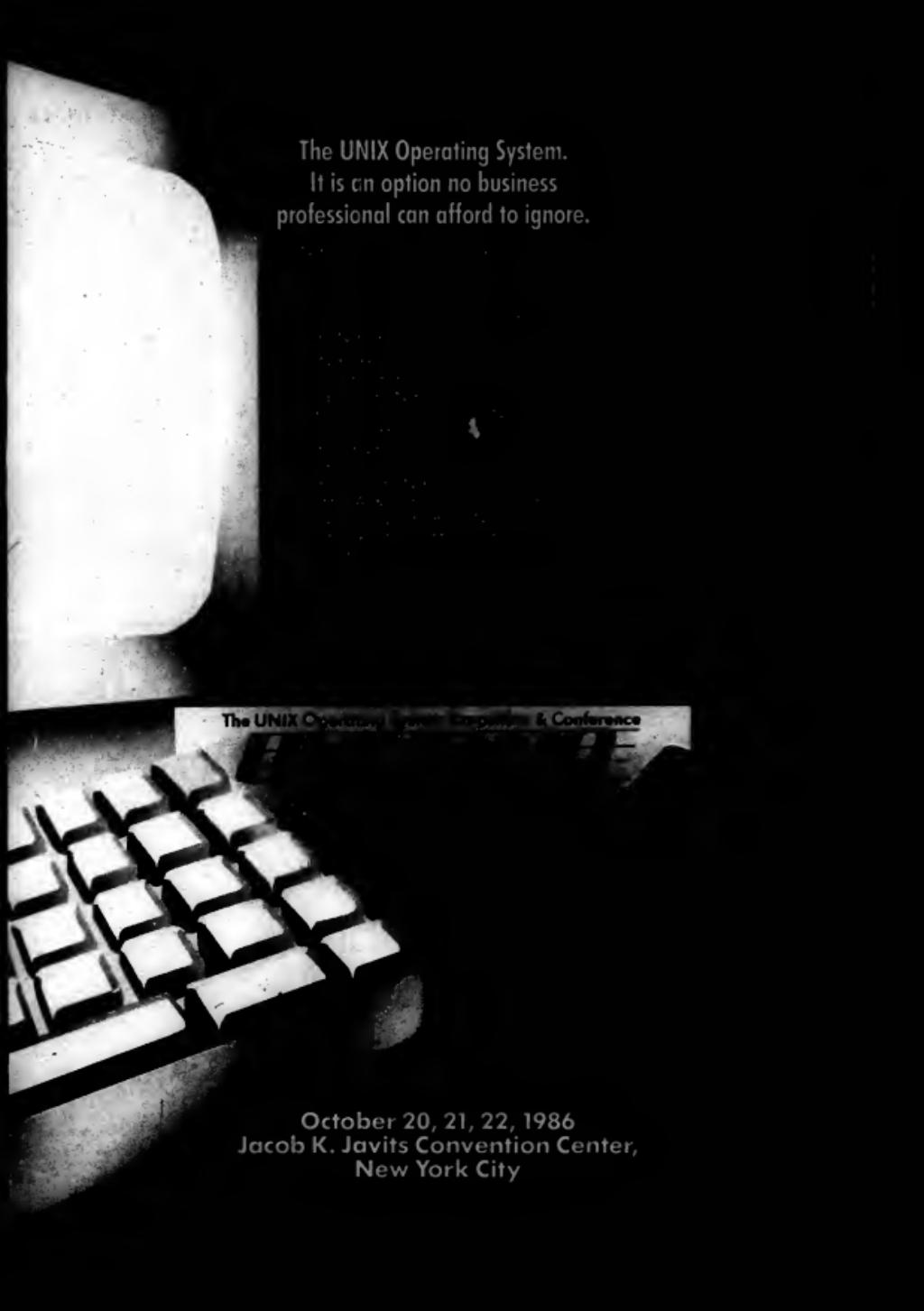
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Mass storage system claims faster access than hard disks

RAM with battery backup aimed at nets

By Peggy Weis

SAN JOSE, Calif. — Santa Clara Systems, Inc. last week announced a mass storage system that acts as a fast-access, random-access memory (RAM) disk with battery backup.

The Batram, which will be sold by both Santa Clara Systems and Novell, Inc., is aimed largely at network use, since it provides faster access times than a hard disk, according to Darrell Evora, Santa Clara Systems' vice-president of marketing. He added that several other OEM agreements

are pending.

The system will also support the Lotus/Intel/Microsoft Expanded Memory Specification (EMS), which provides a kind of memory caching to enable Microsoft Corp. MS-DOS- and IBM PC-DOS-based systems to break the operating system's 640K-byte barrier, Evora said.

Unlike most RAM disks, the product retains data stored in the added memory and includes a rechargeable battery backup for up to two weeks of reserve power. That also enables the unit to be moved; because it is chip-based rather than disk-based, the Batram is sturdier than a hard disk, the firm said.

The Batram — which stands for

Battery Backed-Up RAM — offers from 4M to 80K bytes of RAM storage and is priced starting at \$1,895 for the 4M-byte version.

Each additional 4M-byte memory card, with CMOS RAM chips, is priced at \$1,295.

Units are available now, and Santa Clara Systems promises a version with high-density 1M-byte RAMs by early next year. "The chip-to-disk communication is the biggest bottleneck" in retrieving data on a network, according to Evora. "The server can't transfer data as fast as the CPU wants to get it."

Speed of the Batram disk is limited only by the speed of the processor, Evora added. Systems based on the

Intel Corp. 80386 chip "will make it fly," he said.

Evora said the Batram is also aimed at some disk-intensive single-user applications, such as computer-aided design and manufacturing or desktop publishing.

Also available in mid-September is an optional software utility, Failsafe Storage, which automatically duplicates data exchanges with the RAM disk to an attached hard disk providing fault-tolerant storage.

The first version supports Novell's Netware local-area network (LAN).

Evora said Xenix and Unix support will be available soon, as well as support for other major LAN configurations.

Chip hampers PC AT clone

From page 35

equipped IBM AT.

But Lettich continually had difficulty booting the system. While the accounting applications backlog for the 10-store retail chain piled up, Televideo over the next month and a half replaced the motherboard twice and the entire system twice — all to no avail.

"Multiple problems"

Televideo technical support manager Nor Rehman claimed that Lettich's system had a "multiple problem" with the CMOS RAM chips and the dealer-supplied operating system software.

"It was just bad luck," Rehman

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Unable to boot the latest system from either the hard disk or the original floppy disk, Cynthia Lettich said she had no choice but to get her money back and buy the more expensive IBM AT.

said. The software dealer declined comment.

In late August, unable to boot the latest system from either the hard disk or the original floppy disk, Lettich said she had no choice but to get her money back and buy the more expensive IBM AT.

The IBM machine is working fine, but there is a lot of lost time to make up, Lettich reported.

"We are in critical condition because we waited so long," she said. "People are storming the door with applications."

Despite her difficulties with the Televideo-286 system, Lettich is not soured on clones and holds no grudge against Televideo. If another system is needed, she might even give Televideo another shot.

"No guts, no glory," she said.

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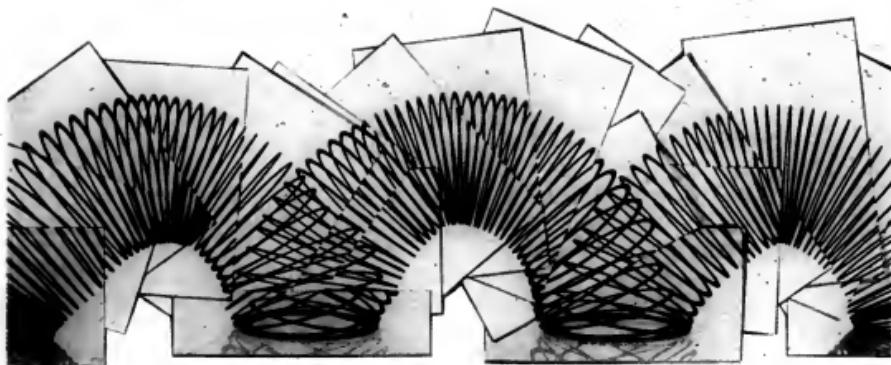
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Edited by Janet Fiderio and Becky Batcha



Moving toward MAP

Until 3.0 arrives, a pilot project is your best bet

By MICKEY WILLIAMSON

If you are an MIS manager in an industrial shop — relax. You have time and a variety of products with which to experiment before you adopt a set Manufacturing Automation Protocol (MAP) implementation plan. As a networking standard, MAP will not stabilize for at least another year.

MAP-standard products that users can buy today are built around Version 2, specifically the currently available MAP 2.1, and MAP 2.2 — an enhancement due out this month.

It is the prospect of Version 3.0, with which these versions are not fully compatible, however, that gives some managers reason to hold off on large-scale commitments.

MAP 3.0 is scheduled for arrival sometime next year and will most likely carry the standard into the future (see story page 40).

But the protocol's instability is no reason for users to shay away. According to most observers, anyone who expects to someday implement a factory-wide MAP network should start working on a

pilot project as soon as possible, because the learning curve is terribly steep.

"We tell people they should proceed cautiously. Evaluate it and have a pilot study to get their people more involved in the overall technology," says Raj Melville, an associate with Booz, Allen & Hamilton, Inc. of Lexington, Mass.

Bob Crowder, president of Ship Star Associates, a Newark, Del., consulting firm, concurs. "I recommend that they install 2,1, pilots: one robot, one machine tool and their favorite host."

Charles Gardner, coordinator of MAP development at Eastman Kodak Co. in Rochester, N.Y., suggests the pilot approach too. He urges people who want to automate around MAP not to wait but to get involved right away.

"The technology is complex enough that you've got some lead times and learning curves that you've got to go through," Gardner says. "Nobody's going to hand you a pill that you swallow, and you've got it. You've got to grow the skills within your organization." Gardner also serves as chairman of the U.S. MAP/Technical Office Protocol (TOP) steering committee.

One good example of how to conduct a pilot program comes straight out of General Motors

Willamson is a technical journalist based in Warwick, Mass. She is the author of *Artificial Intelligence for Microcomputers* (Simon & Schuster, Inc., 1986).

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Continued from page 44

Although the company bypassed the pilot stage, Scott says, it did not do so without a safety net. "We thought the basic technology — radio frequency signaling over broadband cable — was proven enough," he explains. "Besides, we had an innovative fallback position if the MAP didn't work. We knew we could connect radio frequency modules point to point via broadband cable. We knew that would work, so it was a fairly low-risk project."

John Deere never had to rely on the fallback option, because its network operated pretty much as planned. And given the opportunity to do it all again, Scott says he would proceed exactly the same way.

"I'm not really sure MAP 3.0 is a good excuse for not buying anything

99

Until purchasers can be assured of the interoperability of equipment, putting a MAP net together will take a considerable amount of expertise — and the ability to ask the right questions.

right now," he says. "You're never going to be able to get on the phone and call your vendor and say: 'Ship me two GIMs, or ship me a MAP.'"

In addition, Scott says, companies that wait for the ultimate solution in any type of automation project typically end up waiting for a long, long time.

Another organization that is skipping the pilot stage and the wait for

MAP 3.0 is the U.S. Army's Depot System Command in Chambersburg, Pa., which is currently receiving bids on MAP automation for three regional warehouses: the Sharp Army Depot in Lathrop, Calif.; the Red River Army Depot in Texarkana, Texas; and the New Cumberland Army Depot in New Cumberland, Pa.

"They're biggies," says Joseph Sharrash of the Depot Systems Command.

"We're talking in the hundreds of millions" of dollars.

The three MAP systems will fill materials requisitions that come in over the Defense Data Network, comparing orders with inventory records and handling "all the logistics of getting the thing to the door," Sharrash says. Human beings will perform the actual physical labor of assembling the orders, but the system is designed to be "as much as possible a paperless warehouse."

Although the project will not be complete until late 1988, Sharrash says the Army specified MAP 2.1 because "2.1 is the industry standard now, and 3.0 is a thing to come. We want to go with a standard that is state of the art but proven." He says 2.1 is "the leading edge and is usable, even if there are still some problems with it."

One of MAP 2.1's main drawbacks is its inability to support process manufacturers, companies that take raw materials and convert them into finished goods, as opposed to discrete manufacturers like the auto makers, which assemble manufactured components to form complete products.

Process manufacturers need higher communications speeds and higher levels of reliability than MAP was initially designed to provide, according to John Bernard, an associate with Comdata, Inc., a Wellesley, Mass., firm that does consulting and market research in the area of computer-integrated manufacturing. "They have to worry about a whole host of environmental considerations, on one hand, and safety in

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systems made by the same vendor. Each facility has equipment from three separate vendors.

The Pacific Northwest plant operates on systems from IBM, Hewlett-Packard Co. and Data General Corp. The East Coast site has equipment from IBM, HP and Digital Equipment Corp.

When the MAP networks are installed, Miklovic says he expects to see vast improvements in communications at the facilities. One immediate benefit will be instant plant-wide information to managers.

"Our operations people with modeling and simulation tools could have access to performance data to determine what effects any major changes in processes would have," Miklovic claims.

In the meantime, he devotes approximately 45% of his time to what he calls the MAP education process. "You have to remember that there are no MAP experts out there for sale," Miklovic says.

"You need to grow your own, and I'd say it takes one to two years to become knowledgeable on what's real and what isn't."

Miklovic is pleased with Weyerhaeuser's progress and its decision to take a cautious approach to MAP implementation.

"I'll let the others do the bleeding," he says in reference to the number of experimental MAP projects under way. "GM has been spending its money because they need MAP more than we do. We're still answering the question of what we need it for."

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Version 2.2 meets some of those needs. For example, it supports real-time capabilities that allow one device to implement acknowledging the receipt of a message from another.

Further, it adds to MAP's broadband, multichannel capabilities the specification for a carrier-band, single-channel net. Manufacturers can use carrier-band networks as mini-

MAP nets within individual manufacturing cells on the shop floor. The various cell networks can then be linked to others via a broadband connection to a backbone.

Carrier-band networks offer users a relatively inexpensive way to link devices, because they do not require the expensive head-end electronics that broadband networks do.

Adding Version 2.2 capabilities to an existing 2.1 network should not

create any problems, according to Gary Workman, coordinator of GM's MAP development team, because 2.2 is 100% compatible with 2.1. "Every 2.1 system is a 2.2 system," Workman says. "Having selected the proper options, all you need is a router or bridge between the broadband and mini-MAP networks."

The release of Version 3.0 next year will create incompatibilities, though. Version 2 and 3.0 systems

will not communicate directly. MAP's proponents, however, stress that the two can coexist on the same coaxial cable network, even on the same broadband channel.

With compatibility issues outstanding as they are, multi-vendor factories need to reconcile MAP with their total communica-

Continued on next page

Interview

With Version 2.1 in hand, DEC plans for MAP compatibility

By MARCIA BROOKS

Digital Equipment Corp. is one of the most prominent vendors of general-purpose computers for factory-floor applications, and the other vendors that want to sell to General Motors Corp. (it has agreed to support the Manufacturing Automation Protocol).

More than other computer vendors, however, DEC has built its strategy around communications among various classes of processors. Its Decnet architecture supports links to external communications environments and to the IBM Systems Networks Architecture world, but it was primarily designed to optimize communications among DEC's own processors.

Wayne Adams, a DEC marketing specialist for MAP and computer-integrated manufacturing (CIM) products, told Computerworld about the Manufacturing Automation Protocol's position in DEC's long-term strategy during a recent interview.

When did DEC decide to continue to support Open Systems Interconnection (OSI) standards?

We started our program back in 1986 for OSI, but it was more global than what we know today as MAP. We were looking at the X.25 standard, trying to understand something out there for transport and session layers, X.400 and 802.3.

When did DEC make the decision to go for MAP?

We did some early project work for GM around what's now being termed as MAP — working on the communications standards.

Then in 1984 at the National Computer Conference there was a MAP Version 1.0 demonstration. DEC was a member of that.

More work was started in 1982.

DEC has a reputation of being slow to join the MAP effort. What convinced DEC that it should be a player with MAP before it made its own effort?

There was not enough clearance in the original specification [MAP 1.0] to make an engineering effort. When there is an incomplete

specification and you develop products — and other companies develop products — chances are that when you try to hook them up, they won't work. When that happens, you have to write a lot of custom software to make the "standard" interoperable.

So it was a question of being able to provide downstream support?

It wasn't so much support as that there wasn't enough need behind the spec to go out and put the resources into building something that was going to be worth while. With MAP Version 1.0, the concept was there and so was the momentum for the industry standard. But who is

homogeneous environment.

At this point, we want to migrate our Decnet architecture over the course of time to become more OSI-compatible.

Let's switch our focus to implementation. How would you characterize the evolution of OSI — that now spans MAP for factory automation? Are they large or small enterprises, and where are they in their CIM planning?

They make up the Fortune 500 or Fortune 100 companies, and they're starting out following the same path that GM did. Allowing the vendors that they are dealing with in their

needs to network together their manufacturing facilities. For them to invest in the broadband network and to run in common applications and to change the applications when MAP 3.0 arrives is just too costly.

These companies look at automation now, and they want it to solve their needs for five years. They don't look for involvement in an automation project the size and nature of GM's.

Which DEC products are prioritized for MAP compatibility or MAP compatibility?

Right now our VME operating system and our VAX line of computers.

What does that mean for the PDP-11s that are the workhorses of the factory?

They are the workhorses of the factory, and we are looking at incorporating MAP in the PDP-11. At this stage of MAP's evolution, we feel MAP provides the most flexible environment to develop applications on and to develop powerful processor to work with.

What's DEC's timetable for delivery of MAP products?

If you look at your calendar from Sept. 21 to Dec. 20, well, keep an eye on DEC.

Do the independent interoperability tests across MAP vendors have significance?

We encourage them. We realize the complexity of structuring those tests is very difficult when you're looking at all the combinations of vendors. So what's done already as a head start in the marketplace is very good to help push the MAP business further ahead.

MAP is only the conduit. In implementing MAP, one of the key roles will be on the network manager and lead vendor. Does DEC have an interest in being the lead implementor or systems integrator that coordinates and oversees a plant installation among multiple vendors?

We have done that in the past in our software services organization, which takes care of project management and establishes itself as prime contractor.

In addition, we will be announcing a network package geared around our Decnet architecture that will eventually encompass MAP. That will be coming out later this year.



ILLUSTRATION BY RON SIEGEL

going to buy MAP Version 1.0? MAP Version 2.1 had enough detail and all the layers of the reference models to build the product.

In which situation would you recommend Decnet vs. MAP for factory implementation?

That's a very good question, and it's really up to the customer to evaluate.

If he's going to work with one type of programmable controller throughout a factory network that will handle all of his manufacturing needs, he may not want to install a cross-hatched MAP network or have a need for several data networks on one cable pair. He may be able to get away with developing one protocol converter between our host and their programmable controller environment.

But if that same user is looking to expand in the future with other devices, it may be worth the investment to invest in MAP.

Decnet was designed primarily to talk between DEC computers. That is its major strength — talking to a

CIM planning to supply more MAP products for the processor.

Some of them have taken a conservative route, starting out in the lab and installing just a few processes from different vendors — just getting familiar with broadband networking, with token passing and timelines and so on.

Are most of these at this point discrete manufacturers, as opposed to process manufacturers?

I would tend to say the majority are discrete, because MAP came out of discrete manufacturing. But now the process industry users are getting involved.

Do you expect the MAP standard to penetrate beyond the Fortune 100 environment?

Yes. I would tend to think so when MAP 3.0 and further versions come out.

Some of the smaller companies — the Fortune 500 to Fortune 1,000 — only have a need for one data network. They view the carrier-band network as being sufficient for their

Brooks is a senior analyst in International Data Corp.'s computer-integrated manufacturing service. She is also editor of the monthly newsletter, "The CIMS Report."

Continued from previous page
tions environment. Indeed, companies contemplating a MAP installation should make it part of a full CIM plan.

Marcia Brooks, a senior analyst in International Data Corp.'s (IDC) computer-integrated manufacturing service and editor of the monthly newsletter "The CIM Report," is graphic about the importance of a CIM plan. "Any company that's serious about being in manufacturing for the long term is foolish if it doesn't develop a CIM strategy at this point," she said.

CIM means linking an entire company — from the shop floor to shipping and receiving to inventory, purchasing, engineering, accounting, finance and planning and even possibly to terminals at the point of sale



"The most important knowledge that workers pick up with pilots is an understanding of how to integrate components."

— Mark Astor
General Motors Corp.

and in suppliers' offices — for just-in-time inventory management. CIM turns a multitude of departments and divisions into an organic whole, yielding benefits in terms of costs and efficiency.

CIM, of course, depends on network communications. And increasingly, MAP is the protocol of choice to assemble the network. A mammoth undertaking, CIM is implemented in stages, with each stage careful-

ly planned beforehand.

Whether the plan must be complete before any MAP implementation begins is a matter of debate. Ship Star Associates' Crowder thinks companies should set their CIM plan before they attempt any full-scale implementation, but not necessarily before they proceed with a pilot.

"My concern with consulting with customers is that they are better off if they do have a full CIM plan, because the big economic benefits of MAP are from CIM," he says. "If you don't have a CIM plan, you don't have the full benefits of MAP."

But Michael Kaminski, project manager for General Motors' MAP project and MAP's founding father, thinks a complete CIM plan — one that links all business and manufacturing efforts within a large organization — is a completely unrealistic goal.

At GM, he says, "We've been working on it for five years, and we still have a long way to go." What is needed, Kaminski adds, is "a plan that gives you some strategic advantage, one that you keep on updating as you implement so that you can move gracefully as new technologies come into being."

Not every company needs such high levels of integration. Boot, Allen & Hamilton's Melville says that shops with fixed configurations that include a limited number of devices from a single vendor may well want to sit out on MAP implementation altogether.

Among smaller manufacturing companies, cost remains a major issue. Prices vary considerably, depending on what devices are being linked. A basic MAP starter kit that connects two nodes — anything from a robot controller to two personal computers — costs around \$60,000, not counting installation expenses.

A typical starter kit might include two personal computers, communications cards for each of them, coaxial cables to hook them up, and a head end, which converts radio signals transmitted from one node into signals that can be received by the other. Transmission is always at low frequency, reception always at high frequency; the head end, which makes the conversion, is a necessary first buy in any broadband network.

Each node after the first two costs about \$3,000. "To do anything significant in manufacturing, you're certainly over a hundred thousand dollars," Ship Star Associates' Crowder says.

That is too much for many companies, including Rexnord, a \$1.1 billion conglomerate with interests in both discrete and process manufacturing at more than 80 locations worldwide.

At Rexnord, Tom Harris, manager of systems development for the firm's manufacturing research center in Milwaukee, Wis., is responsible for monitoring developments in the MAP standard. He feels current MAP prices are too high.

"I don't see the cost/benefit until you are in a large processing plant where there are a lot of activities going on that need attention right away," Harris says. "In most of our applications, we have very limited

Continued on page 82

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MAP grows up: Version-filled road to maturity a rocky one

The Manufacturing Automation Protocol is some distance from maturity, as Bob Crowder, president of Ship Star Associates, a Newark, Del., consulting firm, sees it. MAP is like a teenager: "a lot of promise and a lot of development left to go."

Right now, MAP encompasses only six of the International Standards Organization's Open Systems Interconnect model's seven layers. The big step in this adolescent's development comes next year, with the expected release of Version 3.0, which will specify all seven layers.

Companies installing MAP implementations now are using Version 2.1. Some will upgrade to 2.2, a similar and compatible version due to be published this month.

The differences between the two current versions are slight, and users should face no problem whatsoever going from one to the other. But 3.0 products, when they arrive on the

upper software layers. Vendors are telling customers that upgrades will involve downloading new software to existing read-only memory chips in 2.1 devices. At worse, some say, users may need to replace some network interface units. MAP devices are meant to not become obsolete.

Because the move from Version 2 to 3.0 will not be a seamless one, however, some observers say that users who wait for 3.0 are perfectly justified in their actions. "There's work to be done if you upgrade," notes Marcia Brooks, a senior analyst at International Data Corp.'s computer-integrated manufacturing service and editor of "The CIMS Re-

port," a monthly newsletter.

Brooks predicts that 3.0 will be MAP's "stable state for a while," although the protocol will undergo change, and says that users can feel safe with Version 3.0 as their baseline. "People can start to implement and be assured that they have compatibility," she says, providing that MAP 3.0 lives up to expectations and that vendors can prove their products meet the standard.

Brooks is also among those MAP proponents who look on the U.S. economy's current sluggishness as a blessing in disguise. The slump gives MAP time to mature before business gets moving and industry starts buy-

ing equipment again, they say.

"The best thing that can happen to MAP is if the economy just stumble along for a while and people don't get ramped up to do their major manufacturing plans for a year or two," Brooks says. If users can just hold off on their purchases until vendors have time to respond to 3.0 with fully compatible equipment, Brooks says, the standards effort will be more or less home free.

She adds, however, that MAP is now well enough established that an early boost in the economy wouldn't hurt. A year ago, she says, that would not have been the case.

— MICKEY WILLIAMSON

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scene, will not converse with Version 2 software, although they may coexist on the same network.

The specter of a new and incompatible protocol specification is keeping many companies from implementing full MAP networks now. Michael Kaminski, project manager for General Motors Corp.'s MAP project and one of MAP's founding members, considers the situation a "rocky one."

Users' reluctance, Kaminski says, is based on an outmoded way of looking at manufacturing technology. "They think you put it in once and that's it," he says, whereas MAP requires gradual, continual change. "We've got it set up so that it doesn't make itself obsolete; it adds functionality."

Companies should be able to port their Version 2 MAP configurations to Version 3.0 without tremendous difficulty. And, as Gary Workman, coordinator of GM's MAP development team, says, "There's no throwing away of things."

Most 3.0 changes will be in the

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Stratus

Continued from page 48
needs to communicate between two devices.

It uses ordinary RS-232 cable for most of his company's interface requirements. "A standard RS-232 link, assuming that you have the software you need on either end, costs about \$70," Harris says, compared with the thousands of dollars a MAP connection requires.

He says he feels that Rexnord operates only one facil-

ty with enough sophisticated machine tools and processes to someday benefit from MAP. At that facility, the company is considering the possibility of connecting some highly sophisticated machine tools with a statistical process-control device that will collect bar-coded inspection data for inventory and quality control. As Harris envisions it, the system would also incorporate a CAD/CAM and Manufactur-

ing Resource Planning II software.

Beyond expense, Harris sees security in MAP networks as an important issue that needs resolution. Although he expects future MAP versions to specify a login and password system for each node, nothing of the sort exists right now. "Once you've got a device attached on a MAP network," he points out, "it can access anything else on the net-

work, anywhere, at any time."

No need to worry about MAP's future

Users who choose to skip MAP for the time being, as Rexnord has, or to wait for 3.0 before they make any commitments need not worry that their lack of interest will diminish MAP's acceptance is

widespread, and there is no longer any question that the standard will survive.

"MAP is not in any danger from the fact that people are not rushing to implement it," IDC's Brooks says. "There's nothing in terms of a multi-vendor protocol to replace it, and users have shown that they want that. They're tired of the finger pointing, the lack of resolution and accountability on the part of vendors."

A vocal group of MAP users is overseeing the protocol's development. Started in 1984 with 60 members from 42 companies, the MAP/TOP Users Group has grown exponentially. (Like MAP, TOP is a subset of the International Standards Organization's seven-layer Open Systems Interconnect, or OSI, communications protocols.) It now claims some 6,000 members, representing 1,400 companies.

The Users Group roster contains names from at least 300 of the Fortune 500 companies, representing a huge chunk of purchasing power. "If you're selling to the GMs and the Du Ponts and Kodaks, you don't have much choice, do you?" Cundata's Bernard notes. He guesses that half of the nation's vendors of manufacturing automation equipment are in some way affected by the GM initiative.

Initially, Bernard says, many vendors will merely supply gateways to link products. But as volume increases, "they'll redesign their products and start incorporating chips that have MAP protocols embedded in them."

Vendors differ in their approaches to providing migration paths to MAP implementations within their installed customer base. To illustrate, Ship Star Associates' Crowder contrasts the responses of IBM and DEC.

"Digital has a clear plan that they're going to migrate OSI right into Decnet, and users will be able to configure systems that have the best of both worlds," he says. "I haven't seen any clear plan like that from IBM for Systems Network Architecture, and I think it will be a couple of years coming, but they will produce MAP products."

Users, however, keep pushing for IBM-to-MAP conversion. Consequently, there is substantial vendor effort to link IBM's 4300 series and MAP.

Altogether, some 30 vendors, including most if not all of the major computer makers, have announced MAP-compliant products and services, and that list is growing almost daily (see story page 51). True, some vendors' announcements are fairly empty proclamations.

Continued on page 64

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Users group engages industrial institute for product testing

ITI designs, administers conformance test suites

In terms of user and vendor commitment, the Manufacturing Automation Protocol has reached the status of a shop floor standard — a standard, that is, in the same sense that there are standard threads in screws: You still can't assume that any two pieces that fit the standard will fit together.

A standard is not of much use without a way to determine conformance, which is why the protocol's proponents are paying a lot of attention to what they commonly call MAP test suites, procedures that determine whether products that promise MAP compatibility actually deliver it.

The MAP/TOP Users Group has sanctioned the Industrial Technology Institute (ITI) of Ann Arbor, Mich., as its official developer and practitioner of conformance tests. In this role, ITI is something like the Underwriters Laboratory of manufacturing automation.

ITI's test suite for MAP 2.1 is not yet fully developed, but testing is under way nonetheless. Currently, tests are available for four of MAP's six layers — the data link, network, transport and session layers — and for part of a fifth, the application layer. No tests are ready for physical-layer MAP specifications, although the institute is working on them.

Managers that submit to testing bring their equipment to Ann Arbor to be linked to ITI's test network, which is based on a Digital Equipment Corp. VAX 11/750 host that runs Eunice, a Unix emulator, under DEC's VMS operating system. A vendor's engineers and programmers accompany its equipment in the hope

that they can correct on the spot any problems that surface.

ITI is currently porting its test software to University of California at Berkeley Unix 4.2 so it can run on a Sun Microsystems, Inc. workstation, according to Michael Schumacher, an ITI researcher.

When that is done, vendors will be able to run the tests at their own sites, so they can be assured their equipment will pass the tests when it arrives at the institute. The result should be a less expensive testing process.

Participating vendors are supplied with a test results document, which summarizes the outcome of each test

— noting whether a piece of equipment passed, failed or did not attempt a given procedure — and then details the results of each ITI procedure.

ITI maintains confidentiality concerning test results, although it will, at the vendor's request, confirm that a vendor's equipment has been tested. Vendors must furnish their own copies of the test document for prospective customers. "A purchaser would probably want to see at least the summary page," Schumacher says.

Also part of the testing picture is the Corporation for Open Systems (COS), an organization of vendors

founded in January, which is also working to develop conformance tests. COS, however, is not expected to have tests ready before the middle of 1987.

In theory, products that pass conformance tests should work when connected to others that have passed the same tests, but with MAP in its current immature state, that is not always the case.

So far, Schumacher says, no one is tracking the interoperability of equipment that has passed conformance testing. That is, he adds, "an interesting study that needs to be done."

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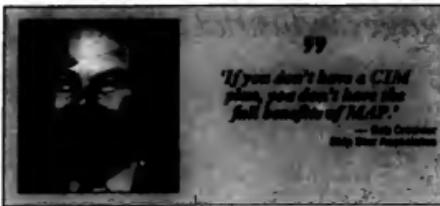
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Continued from page 53
 with delivery dates off somewhere in the future. But, according to GM's Kaminski, there are enough MAP products on the shelf to permit users to take the plunge.

Obviously, implementing a MAP network is no trivial task. Factory floor applications typically require users to write custom software, and there is a great deal that a firm must learn about MAP technology before it even begins to think about implementation.

Whether MAP is important enough to spend time learning about, says Eastman Kodak's Gardner, depends on "whether leading-edge technology is important to the survival of your business. If it's not, sit



back and relax. But if you need to compete in the world marketplace, then you'd better be involved."

Besides linking manufacturing robots and the devices that control them, MAP is intended to connect

factory equipment with the corporate data base as part of a CIM system.

When MAP matures, any vendor's CAD workstations in the engineering department, for example, will be able

to send design changes to any other vendor's numerical controller on the shop floor, which will then relay those instructions to any third vendor's robot. Inspection robots will be able to relay data directly to the corporate mainframe, facilitating the implementation of just-in-time manufacturing systems that depend on 100% perfection in manufacturing components.

The MAP protocol will eventually link payroll records, shipping registers and accounts receivable — virtually every aspect of a company's operations with every related part of the corporate data base.

GM's Kaminski, certainly the most effusive of MAP's backers but a voice to heed nonetheless, sees the efficiencies that will result from compatibility as a boon to American industry. "MAP is going to allow us to do our automation inexpensively and quickly and to change it easily," he explains. "It's going to really enhance our visibility as a manufacturing country."

The role that MIS can play in making this happen is hard to exaggerate, and many MIS managers are seeking information about how the whole MAP scheme fits together.

Visitors to the Autofact '86 trade show in Detroit last November had a chance to see the first working MAP installation. A joint effort between Boeing Computer Services Co. and GM, the demonstration included equipment from 25 different vendors using MAP 2.1 specifications. Equipment was installed at 14 different sites on the trade show floor.

The demonstration used a variation on the classic tower of Hanoi puzzle, in which a stack of rings must be transferred from one peg to another, using a third peg for temporary storage. The problem is that only one ring may be moved at a time, and no ring may ever be placed on top of a smaller one.

The show demonstration used rings of various sizes and colors. Spectators could go to any of 14 vendors' booths and order a custom-made tower, specifying the size and color of its rings. Each order was picked by a job scheduling system, placed in a queue on one of two assembly lines and handed off to a job dispatching system, which relayed instructions and status update messages to a variety of robots and programmable controllers. There were also inspection stations to check on the size of the peg holes and on the colors of the rings.

From an application standpoint, the system's performance was less than perfect, GM's Workman says, but the communications process — MAP's shining glory — worked as planned.

GM is currently sponsoring a traveling MAP road show in a 5,000 square-foot booth that contains an active MAP local area network. It has appeared at five trade shows in the last six months and is scheduled to make many more exhibits: the National Machine Tool Builders Association's International Machine Tools Show in Chicago Oct. 3 to 12 and the Instrument Society of America's show in Houston Oct. 13 to 16.

At each of its outings so far, the MAP display has attracted several hundred people, further evidence of the strong future of the MAP standard and the importance of getting involved soon.



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**Nationwide Service From
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In Depth

By MICHAEL SULLIVAN-TRAINOR

You may not have to be an expert to develop an expert system. But to capture the knowledge of key members of your organization by using current expert systems shells, you have to come awfully close.

That is what Department of Energy (DOE) researchers at the Oak Ridge National Laboratory in Oak Ridge, Tenn., discovered when developing one of the first expert systems applications for the government's budget process.

Created for the Naval Sea Systems Command (Navsea) of the U.S. Navy, the prototype expert system mimics the decision-making capabilities of critical budget analysts. The need for such a system is vital at Navsea's Facility Management Directorate, Appropriated Funds/Budget Coordination Branch, where the eight budget analysts are being asked to take on additional responsibilities without an increase in personnel.

Ideally, the system will act as a decision aid to the analysts, helping them to be more productive. It will also preserve the analysts' expertise by recording the decision-making process of staff members with many years of experience. That way, the expertise will not evaporate when the employees retire.

PC-based system

The expert system — called Bans (for Budget Analysts) — operates on IBM Personal Computers, which are used by each of the analysts. Developed using Rutgers University's domain-independent expert system shell called Expert, Bans will be tested during the Navy's next budgeting process later this year.

The prototype was developed on a Digital Equipment Corp. VAX-11/780 by DOE researchers, and the PC version was later designed by Applied Management Sciences, Inc. of Silver Spring, Md., using Teknowledge, Inc.'s expert system skeleton, M.I.

Sullivan-Trainor is a senior writer for Computerworld.

Case History

U.S. Navy: Knowledge base harvests expertise of budgeters

At the Navsea budgeting branch, analysts manage and control the major aspects of budget preparation, submission and execution for a group of 28 activities in the areas of operations and maintenance, weapons procurement and other procurement. They share management of the accounts of each of the activities, which include shipyards, shipbuilding and inactive ship maintenance. The analysts' levels of responsibility range from funds administration to complete program management.

Each year, the analysts must review several thousand pages of budget requests, identify areas with increases

over last year's budget lines and provide justifications for those increases — all within a two-week period.

As funding levels change throughout the year, the analysts must decide on budget allocations and reallocations as well as review each activity's performance, comparing it with a control budget.

Originally sorted and filed manually, the requests are currently stored in a data base and accessed by the analysts on their PCs. While this process gets the job done, an expert system tied to the data base will allow analysts to work more quickly.

In fact, in an initial test of the prototype, Bans took 15 minutes to run through a budget analysis that normally

takes two to three hours for an analyst to perform.

DOE researchers chose Expert to develop Bans because the shell was designed for classification problems and could be adapted to the budget categories examined by Navsea's analysts.

The design of Expert was influenced by Casnet, a medical system used to diagnose glaucoma. The tool was developed by Sholom Weiss and Casimir Kulikowski at Rutgers University in the late 1970s and has been used by them in a variety of applications including oil well log analysis, computer fault diagnosis and medical diagnosis.

Greatest challenge: digging

Expert requires relatively little technical capability to use and leaves the collecting and quantifying of the experts' knowledge as the greatest challenge.

According to the DOE's Mary Enrich, the primary researcher for the project, "You don't become an expert yourself necessarily, but you become very knowledgeable about the tools, the topic and the people involved. That includes a lot of things like how they operate and how they approach problems."

Before approaching any of the analysts, Enrich spent a month researching the budgeting branch, digging into decision-making procedures and reading about the results of the analysts' work.

"If you don't do your homework and know the experts' terminology, you won't know whether something is a problem or not. What happens in an interview is that you nod your head, and the speaker assumes you understand. You might just be acknowledging that you heard what was said and not know what they meant exactly. You need the background information to know what specifics to follow up," she says.

Pursuing the knowledge behind analysts' decisions is a matter of trial and error, interviewing and 'diplomatic nit-picking.'



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To collect the information required for Bans, Enrich conducted a series of interviews with the more cooperative analysts. Engaging in an interactive process of "dipstick sampling," Enrich pursued the trails of knowledge that stand behind the decisions each analyst makes, and she learned a lot about human behavior.

"Some of the analysts were quick to understand what I wanted, but others needed time to respond. You need to be cognizant of the personality types and how they might react. It's important to choose experts who can readily verbalize what they do," she says.

Being careful to allay fears that the staff would be replaced by a computer system, Enrich explained to the analysts that the expert system was being developed to aid in their decision making and reduce their work load. In addition, she was careful not to challenge their methods of reasoning.

"You don't want to question their authority or make them feel that they have to come up with a hundred thousand reasons why they do something," she adds.

Constructing Bans using Expert required Enrich to code the decision-making procedures of Navsea's budget analysts in the form of a Fortran program. This was accomplished with the help of system prompts on different levels.

For example, Enrich would input the hypotheses, and the system would instruct her to input the taxonomies that go with that hypothesis, as well as the appropriate conclusions.

"It involves breaking down the problem-solving methods that the analysts use and putting them into computer code. You fill in the hypotheses and conclusions, as well as other findings," she says.

Speed of entry is key with the system on a VAX, she notes. "It's not as sophisticated or user-friendly as some of the other tools that have just come out, especially the personal computer-based tools. It's much more than filling in the blanks. The system gives you the format that it needs, and you have to decide how to go about it."

Coding intuitive decisions

Enrich's quest for the analysts' knowledge was hampered by the heavy work schedule of each analyst and by the lack of clarity some of the analysts used in stating their own reasons for approving requests. For example, one analyst started Enrich when she gave this response to a question: "It kind of depends on how I feel that day."

Further digging revealed that her "how I feel" amounted to intuitive decision making based on years of experience and arbitrary decision making based on her mood.

This analyst was able to draw on such factors as the history of the purchasing activity and the spending record of the organization making the request. These factors were known to the analyst but not immediately available to anyone else. What appeared at first to be intangible could, it turned out, be coded, given the right information.

Often, Enrich found, the analysts would simply "know" whether certain requests were in line with current inflation rates and personnel levels. They knew whether a certain

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Constructing Bans using Expert required Enrich to code the decision-making procedures of Navsea's budget analysts in the form of a Fortran program.



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Expert shell captures U.S. Army regulations

By AMY SOMMERFELD PHINE

As little as two years ago, no one at the U.S. Army Logistics Center in Fort Lee, Va., had ever worked with artificial intelligence. Now, their Personnel Requirements Knowledge System, known as PERKS, is almost ready to help Army force designers determine how many support personnel are required in new units.

PERKS is being built by a team of six programmers and operations research analysts who brought no AI training to the project. "There are two schools of thought," explains William "Ollie" Hedgepeth, the Logistics Center's AI program manager. "We're following the school of thought that takes a computer expert and lets him learn enough about the expert's work processes to develop a system. Some organizations train the expert in how to develop his own system, but that's not our philosophy."

The Army sought to cultivate AI expertise in-house. In September 1984, the Army's vice-chief of staff directed the Logistics Center to look into the feasibility of tying AI to relational data base management via a natural language query system. "We originally wanted to see if we could do it, since AI was all about," Hedgepeth says.

The result, a year later, was the first system ever to link the Ingres relational data base from Relational Technology, Inc. to LISP and Digital Equipment Corp.'s OPSIS language. "That was our major accomplishment the first year," Hedgepeth says. "We proved that we could do it."

After that came a list of applications projects to evaluate as possible expert or knowledge-based systems. The personnel application that became PERKS fit the criteria nicely: Decision-making rules were already set down in writing, and expert analysts worked nearby, facilitating quick consultations.

The basic information for PERKS came from Army Regulation 570-2, *Personnel Requirements Criteria*. So far, the team has created a 126-rule knowledge base that governs the personnel requirements for the quartermaster and

Flora is a Computerworld associate editor.

supply services chapter of AR 570-2. The team has another 11 chapters of the manual to go before the project is finished.

Pat Jones, AI team leader at the Logistics Center, explains, "PERKS is designed to help the logistics analysts here ... who use their knowledge to define the personnel requirements for different military organizations that need certain types of clerks or fuel handlers or food supply personnel — about 18 kinds of personnel."

"The key thing," she continues, "is that PERKS applies the reg the same way every time. If the user is tired or comes in one morning and doesn't feel well and he has to design a new unit, as long as he picks the right things on the PERKS menu, he'll get the right answer."

The knowledge-based system will help keep decisions consistent. "You're talking about quality control of military logistics analysis," Hedgepeth says. The Logistics Center does not intend to replace any staff members with the system but hopes the added productivity will allow workers to tackle projects not currently being done. The system will also be used for training.

The Logistics Center chose the Symbolics Inc. 3640 computer, a single-user system with a high-resolution monitor. Development started with the center's DEC VAX-11/780 for the initial AI data retrieval system but found the VAX, saturated with other users, demonstrated slow response times.

The AI team purchased Intellicorp's Knowledge Engineering Environment (KEE) software because of its versatility and sophisticated user interface. The KEE System provides both forward and backward chaining on rules and inference structure.

KEE's accessible user interface suited the inexperienced AI team. "The AI languages we used in the first project were a nightmare. KEE is relatively easier to learn," Hedgepeth says. Two team members took a one-week course about KEE. "Within two weeks, they had 40 rules in a production system, and it looked great," he adds.

The AI team has faced some serious obstacles, however. For one thing, the limitation of relying on a single-user system slowed development un-

expectedly. Moreover, KEE's user interface turned out to have its drawbacks.

"The interface, which involves the use of icons, is very flashy," Jones explains. "But we needed more interaction on the screen at one time than KEE could offer." The AI team tried to circumvent the icons, but the software proved resistant to their attempts. "In the present version of KEE, there seems to be no way to do what we want to do. It will be a matter of working around the KEE images," Jones says.

Short but frequent sessions with the functional expert proved critical to developing a useful system. "Army regulations often have rules that aren't clearly defined," Jones says. "The words may have multiple interpretations so the users will have some leeway." PERKS now contains extra subdivisions of some rules, with clarifications supplied by the expert user. The expert also suggested creating an automated history of user suggestions for rule additions or changes. The final version of this chapter, due later this month, will include more than 200 rules.

The Army uses other knowledge-based systems for maintenance, diagnostics and planning, but few have been developed exclusively for Army staff members. Jones says, "What we may be proudest of is that we've shown the skeptics you don't have to be a Ph.D. in artificial intelligence or spend millions of dollars hiring an outside contractor to develop a sound, reputable product."

The team's work will remain unclassified. "We're very open-door here," Hedgepeth says. "We're doing technology transfer big-time both inside and outside the Army. Our commanding general is very communications-oriented."

Projects now on the slate favor the Logistics Center, but over the next five years, Hedgepeth says, given available technology and low-cost delivery vehicles such as the Xerox Corp. 1185, they may begin AI projects for other organizations. "Our early success cascaded into a production-type environment where our charter was about 90% rewritten to look at AI developments only," Hedgepeth says.

'We've shown the skeptics you don't have to be a Ph.D. in AI or spend millions of dollars on an outside contractor to develop a sound, reputable product.'

— Pat Jones,
Army Logistics Center

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utility increase was justified, based on current rate hikes, or whether new construction was appropriate for the requesting site.

"You have to dig out the specific reasons that one request was approved and another disapproved. You need to quantify them somehow, have them verbalized or put them in writing. Sometimes it's very difficult for an expert to put into words what he's thinking or talk about what he's done so often each day," Enrich says.

The only way to reach that essential information is through probing, questioning and probing. According to Enrich, "You have to go back and recheck the questions that you asked. Are you getting the responses you wanted?"

Writing the rules

This trial-and-error interviewing process became the basis for the procedures programmed into Bans. After the system designer input the experts' knowledge and heuristics, these were repre-

sented by the shell in the form of production (If-then) rules. Enrich then had to make judgment calls to determine which rules to include in the system.

In building Bans, Enrich began by using Expert's editor to create the file of rules, which she compiled. The compiled version is executed when the system is operating.

Each decision-making model has three major sections:

- Hypotheses
- Findings
- Decision rules relating the findings to hypotheses. An end user chooses from a list of possible findings that are appropriate for the specific interaction, and then — using the decision rules — the system infers and outputs the appropriate hypothesis.

The findings section represents the input for the decision: the initial determination of the problem and a listing of questions and answers. Hypotheses are the

available conclusions the system can reach. The decision rules input by the system designer link the two.

Each rule can have a weighted value or confidence factor assigned to it by the system designer. By giving a weighted value to the importance of the rule relative to other rules and/or to the solution at hand, the system codifies the expert's uncertainty. This, in turn, lets the end user know what extent he can rely on the conclusion.

A Bans session works in the following way:

In an interview consultation mode, an end user may be faced with a decision regarding a department's report of insufficient funds. Bans queries the user and develops specific findings for a given problem based on the end user's responses to several types of questions: multiple choice, numerical, yes/no and checklists. Questions are grouped in questionnaires, which arrange the questions in the order to be considered. This allows

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for rule re-evaluation, if necessary, after each response.

In this case, Bans asks for the type of problem, and the user responds that it is a financial problem. Bans asks whether the problem involves surplus funds, a request for new funds or another financial problem.

The user then selects the nature of the problem, its priority level and a number identifying the type of activity involved. The user also responds to Bans' requests for information on the availability of funds for the activity, whether the Navsea master budget currently shows a surplus and whether the activity in question has a good track record.

Bans summarizes the results of the interaction and states conclusions accompanied by a confidence level. Conclusions come in the form

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While the expert system has already proved to work faster than the analysts, the goal is for greater consistency in decision making, and further enhancements must be made to reach that objective. Says Enrich, 'From the beginning, the outputs were very close to what the experts were doing.'

of a diagnosis and a recommended treatment. With the diagnosis, "give more funds to the activity," the treatment options are "transfer funds," "give more consideration" or "delay the request."

In this example, the end user fills in findings consisting of a good record of spending by that department and a high priority for the project

because it is considered critical. These findings lead to the hypothesis that more funds should be granted with a very high certainty factor.

Yes, no, maybe

In a case involving a budget submission from an activity with a poor track record, Bans responds by indicating that there is only a 50-50

chance that the request for additional funding should be approved. Instead, Bans recommends, the request should be looked into further, which may require supplemental information, such as a letter of justification. Letters like these can be initiated by Bans, along with a memorandum to the directorate detailing the action.

In another case, an end user answers that the problem is financial — there are insufficient funds within the activity's budget — but the master budget shows a surplus. In this case, the conclusion might again be to grant additional funds but with a lower certainty factor.

Bans also allows the user to retrieve the list of rules on which it based its conclusions. By asking "why," the user can view Bans' line of reasoning in a forward chaining format. Functional findings may be listed at the end of the findings section, where mathematical operations, such as ratios between numerical findings, may be defined.

Certainty factors were assigned based on judgment calls that Enrich made based on her interviews with the analysts. The formal, accurate certainty factors will not be developed until the system is tested this year and the frequency of certain decisions can be assessed. This area of certainty is under study by the DOE's artificial intelligence research group, and the results will help determine a formal methodology for assigning such confidence factors.

Besides resolving financial queries, Bans can answer questions regarding the names of ship commanders or personnel control activities. For example, the system could address a problem involving the inactivation, preservation or maintenance of a particular ship.

fine-tuning for accuracy

After the prototypes for Bans were constructed, the analysts and their supervisor examined the system to determine its accuracy.

"In general, they determined that Bans had captured the ideas and methods of the analysts," Enrich says. "They said, 'This is what I do, but it's not exactly the way I do it.'"

Faced with this response, the agency began fine-tuning Bans to reflect more closely the analysts' reasoning process and to increase the system's accessibility through improved user interfaces.

While the system has already proved to be better than the analysts, the goal is for greater consistency in decision making, and further enhancements must be made to reach that objective.

"From the beginning, the outputs were very close to what the experts were doing," Enrich says.

One enhancement will be the addition of a formalized budget request submissions format that will present Bans with consistent information about an activity. Currently, the requests are often submitted incomplete and in different formats.

Though it will be tested on some of the budget requests this fall, Bans has not reached the point at which it will be used on its own, as a complement to the current staff of analysts. Instead, the system will analyze the same problems that a particular analyst handles, and the two results will be compared. The system is expected to be fully operational as a decision support tool for the analysts in the fall of 1987.

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MANAGEMENT



TAKING CHARGE

Ross Perot

Success in business

The following speech, delivered to the Junior Chamber of Commerce in Grand Rapids, Mich., reflects Perot's overall management philosophy.

First, let us talk about what success really is.

Success is doing something you enjoy and doing it well. The teacher, minister, elected official, military officer or missionary who is tops in his or her field is every bit as successful as the person who makes a great deal of money. The best way to measure success is in terms of personal accomplishment and personal satisfaction.

As a young person looking ahead to your career, the most important thing you can do is to be honest with yourself. Nobody else can know you as well as you know yourself. Certainly, no personnel director or recruiter can figure out what you really ought to do as well as you can.

Unfortunately, too many people have stereotyped opinions about what they ought to try to become, and they let these override what they really want to be.

My advice is simple: Size yourself up. Figure out your strengths and weaknesses. Plan a career that centers around your strengths, not your weaknesses. Commit yourself to that career. Learn to do whatever it is you set out to do better than anyone else.

Probably the most important advice I can give to a group of young people is to remember that life is not orderly. In

See **SUCCESS** page 64

Perot is founder and chairman of Electronic Data Systems Corp.

Federated invests in PC ATs

Replacement of terminals aimed at speeding trades

By David A. Loeffler

PITTSBURGH — In a two-pronged thrust, Federated Investors, Inc. is replacing the on-line system that institutional investors use to buy and sell its mutual funds.

By replacing dumb terminals with personal computers and rewriting software, Federated aims to make the network more flexible and easier to use, company officials say. Roughly 1,500 bank trust departments and other money managers nationwide use the system.

Federated, which manages nearly \$2 billion in assets, is in the midst of replacing Digital Equipment Corp. LA-34 terminals used in the Tandem Computers, Inc.-based system with IBM Personal Computer ATs and rewriting part of the system software.

That should reduce the transmission time and effort required for clients to

make transactions, according to Paul Angell, a Federated vice-president and the firm's director of data processing.

Angell says Federated is rewriting the back end of the software to accommodate the changes but leaving users' procedures intact. "We wanted to make sure we didn't cause any confusion at the bank level," he adds.

The ATs with the new software validate the client's transaction themselves, rather than relying on the mainframe at Federated's headquarters, and transmit orders at 1,200 bit/sec. rather than 300 bit/sec., according to Angell.

The new system also avoids the need for users to key in numbers to identify their bank, the fund they are trading and their account, requiring only menu selections, a dollar amount and indication of whether the transaction is a buy or a sell, he says.

"With the PC [AT] we have the intelligence in the field to be able to do that. That is a major improvement to our world.

See **FEDERATED** page 65

INSIDE

Calendar: Selected shows, conferences and exhibitions/67

INSTANT ANALYSIS

'The users are the revenue producers within the corporation. It is MIS's role to serve them.'

— Herb Hirsch, president of Hoffrichter Associates, Inc., Stamford, Conn.



Paul Angell

Businesses eye checkout scanner data to determine pricing, promotion plans

By David A. Loeffler

Interest on the part of supermarket chains, consumer products makers and advertising agencies underscores the increasing attention being paid to data gleaned from scanners at supermarket checkout counters.

The heightened interest in the data stems from both intensifying competition for consumer dollars and advances in computer and scanner technology. Where stores once used the numbers chiefly to keep shelves stocked, manufacturers and retailers now pore over them in determining their pricing, promotion, allocation of shelf space and which brands they will sell.

"What began as a revolution in inventory control is now becoming one in management, because the quality of the data is there," says Lee Cooper, an associate professor at the University of California at Los Angeles (UCLA) Graduate School of Management.

Cooper is working on analysis of scanner data for consumer products giant Procter and Gamble Co., as are other academics at the University of Chicago and the University of Texas.

Procter and Gamble is characteristically mum on its interest in scanner data. One source familiar with the work says officials of the company are under a gag order

See **BUSINESSES** page 65

MANAGEMENT MEMO

McDonald's menu goes on-line; VDTs said to slow reading

Joining the trend toward capturing point-of-sale data (see story this page), McDonald's Corp. has put terminals at a number of its fast food outlets on-line.

Lana Erhsan, a spokeswoman for McDonald's, confirmed the company is testing the concept but declined to provide details. "We are looking into it. We're not ready to talk about it now," Erhsan said. She added that the company is undertaking the experiment "to make it easier for managers to conduct business or make things flow more smoothly in the restaurants."

Reading from computer screens is more difficult than reading from

paper despite improvements in screen design, according to researchers at The American Institutes for Research in Washington, D.C.

The relative difficulty of reading computer screens may make finding typographic errors harder and make solving problems take longer, even when users prefer screens, according to Carol Mills, director of the institute's Usability Test Laboratory.

Researchers say they are not sure why reading from screens is more difficult. Practice does not seem to make the difference; people reading from screens all day still do better with paper, according to John D. Gould of IBM's Thomas J. Watson Research Center.

Mills says software developers must recognize the importance of designing screens for readability. For easier reading on screens, she suggests a combination of upper case and lower case letters, ragged right margins and double spacing.

■

This fall, the Rochester Institute of Technology launches an undergraduate program to train students to communicate effectively about complex technology. A spokesman from the school says the program is "driven by the growing need for professionals who can translate technology into plain English."

Students in the program will learn the theory and practice of spoken,

written and visual communication while pursuing one of the school's professional or technical programs in business, computer science, printing, photography or science.

The university foresees graduates following careers in fields such as technical writing, editing, marketing, communications training, mass media and public relations.

"The shortage of professionals who can speak, write and think clearly has been identified as a severe 'managerial problem,'" said Bruce Austin, chairman of the program. "This program relates to everyone who has ever experienced the frustration of following 'simple' directions that don't make sense."

MANAGEMENT

Success in business

From page 63

many cases, life is not logical. Business and life do not follow the neat lines of an organization chart. Both business and life are far more like a cobweb. As you commit yourself to a business career, remain flexible, realizing that the more you learn about a business, the keener your insight will be about what you really want to do.

Don't ever lose the traits you had as a child. As a child, you were totally comfortable in deciding one day to be a teacher; the next, a professional athlete; and without any hesitation, to change to a brain surgeon, plumber, lawyer, jockey or whatever else suited your fancy. Unfortunately, after you became an adult, you acquired a strong need to be consistent.

Within our company, I occasionally encounter great young people who, based on their initial knowledge of EDS [Electronic Data Systems Corp.], selected a position in our business. Over a period of time, they realized they would be better suited in another area of EDS. They never discussed it, fearing that EDS had provided a great deal of money into training them, and, having committed themselves to a job, they felt they should stick with it.

The end result is that at some point in time, these people come in terribly disturbed. In most cases, they feel EDS should have intuitively sensed those things they were never willing to discuss with anyone.

We work very hard in EDS to keep a climate that allows each person the personal freedom to choose a different career path, based on additional knowledge and experience.

If you have made a mistake in your career choice, talk to the people in your company. Tell them what you want to do. The more successful you are, the more successful your company becomes.

The steps to success

How does a young person become successful? Here are some simple steps:

- Pick an industry that attracts you

- Pick the company in the industry that has the greatest appeal to you. Until you find something that you just couldn't stand not being a part of, keep looking.

- Serve an apprenticeship in that company. Learn all about it and the industry — become an expert.

- Look for unmet needs. Look for markets that are not being satisfied.

- Develop ideas to satisfy these needs. Present these ideas to your company. If the idea is sound and your company is sensitive and alert, you will have an opportunity to turn your idea into reality.

In my case, the company I was working for was not interested in the idea I developed. I decided to start my own business because I was convinced that my idea was sound. That idea is now EDS.

Again, though, before you branch out on your own, know yourself. In this large group here tonight, there are probably no more than two or three people who should start their own business. The failure rate of

new businesses approaches 100%. The failure of new businesses started by people who have the capability to start a new business is still extremely high because of all the pressures and stresses inherent in turning an idea into a business.

I have had a particularly unique experience in watching several thousand great young people start their business careers. Again and again, I have seen these people approach business as a hundred-yard dash. They initially had great energy, great ambition, but they poured so much energy into their efforts for a brief period of time that they were unable to produce a great, sustained performance, month in and

month out.

Never forget that a business career is a cross-country run, requiring you to produce consistently over a period of years.

Nobody has developed a course that successfully teaches young people starting out in business. Inevitably, they are going to exhaust themselves. Hopefully, they will be tough enough to survive that experience and learn to pace themselves.

As you build your career, you will have to make another decision: to develop your career along professional lines or go into management.

Unfortunately, many young men and women in business today feel



EDS's Perot

they are failures unless they go into management. My reply to these people is simple. What if Dr. DeBakey, one of the world's foremost heart surgeons, had decided to be a hospital administrator? The world would have lost a gifted heart surgeon.

In EDS, our business is the operation of huge computer centers and systems engineering. What would EDS's future be if its most skilled computer center staff and its senior-level management careers became managers? EDS would lose its greatness.

It takes both the professional and the generalist. Both areas are of equal importance. Don't let yourself get confused on this subject and feel that you must force yourself into management even though you really want to develop your career along professional lines.

See **SUCCESS** page 66



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MANAGEMENT

Federated invests in IBM PC ATs

From page 63

It's a strategic move as far as I am concerned," Angel says.

Joe Gaafar, assistant trust officer at Lafayette National Bank in Lafayette, Ind., and a user of the system, concurs. "It's really helped us out quite a bit. It seems like they've been able to speed up the process as well as give us a bit more information," Gaafar says.

Federated began replacing terminals with PC ATs last December and now has about 1,100 in place, Angel says. He adds that he expects to have that job completed and the software rewritten by the end of this year.

The firm first went on-line with clients in 1981 with its Edge network, a forerunner to the present Federated Network. The Edge system ran on three Tandem Nonstop computers, which employ parallel processing, and the DEC terminals.

Since 1982, the number of transactions the firm handles each business day has grown from about 300 to roughly 15,000, joining approximately 8,000 members a day, according to Angel. The staff of 50 handles the transactions, most of which take place between 10:00 a.m. and noon, he says. "There would be no way you could support those transactions in a manual mode," Angel says.

Before the Edge system was in place, Federated clients called orders in to Pittsburgh by telephone, where a data entry clerk keypunched them into a computer for validation. If the order

was good, the computer sent it to Federated's bank servicing agent, State Street Bank and Trust Co. of Boston.

There the order was keyed into a Federal Reserve Bank system, which transmitted cash to or from the client. If the order was not valid, the Federated operator would not know about it until hours later.

The on-line system automatically validates orders with Federated's bank, providing clients with hard-copy printouts, posts them with State Street Bank and Trust and sends them to the Federal Reserve wire system.

In addition to speeding up transactions, the on-line system has cut the costs of order entry in half, Angel says. It also provides clients with information on their investments, current interest rates and Federated products.

Businesses eye scanner data

From page 63

not to speak about it.

"It's clearly of great interest [in the consumer products industry]," says Louise Booth, Safeway's manager of scanner marketing research.

Supermarket chains are increasingly using the data captured by their scanners to assess profit on a product-by-product basis, evaluating the impact of special promotions and planning how to allocate valuable shelf space.

Some, such as Safeway Stores, Inc. of Oakland, Calif., sell the data on magnetic tape to market research firms and manufacturers. Such clients usually order data for sales of specified products, stores and weeks, says Louise Booth, Safeway's manager of scanner marketing research.

Safeway also does data processing for clients — compiling reports on sales of different brands of a product for different stores and even does test marketing itself, capturing the results with scanners.

For instance, the researcher might compare the sales of an item displayed at the end of an aisle with those of the same product bought from the shelf, identifying them with different product codes.

Safeway's sales of such data, processed by IBM mainframes that were already in-house, represent a substantial and growing source of revenue for the company, Booth says.

Before the refinement of scanner technology, the chief source of consumer spending data was bimonthly reports put out by market research firms such as A.C. Nielsen Co. and Selling Areas Marketing, Inc. (SAM), a subsidiary of Time, Inc.

Additional players

While Nielsen and SAMI have kept up with the introduction of scanners, buying data from retailers, the new technology has brought additional players into the business.

Information Resources, Inc. (IRI) of Chicago went into business in 1979 with BehaviorScan, a research service for test marketing that captures scanner data, transmitted on-line from retailers in eight market areas.

This summer, IRI rolled out Infoscan, a nationwide service for tracking consumer spending at supermarkets in more than 40 markets. Its system is on-line with 120 stores and the headquarters of a half-dozen major retailers, according to Tom Daly, an Infoscan marketing representative.

Infoscan, using a data dictionary of more than 500,000 items classified by the Universal Product Code, uses mostly mainframe computers. The software unit employs Express, a data base developed by IRI, for final analysis and presentation of data, says Tom MacNeary, IRI's vice-president of retail consulting.

Also this summer, Ogilvy Group, which operates one of the country's largest advertising agencies, disclosed in an in-house publication that it is on-line with a shelf space management system in New York. A spokeswoman for the company declined to comment further, saying announcements would be forthcoming.



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EPSON
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MANAGEMENT

Success in business

From page 64

Again, know yourself. Know your strengths and weaknesses. Play to your strengths. That's what every winning team does. That's what every very successful person in business seems to do. Whether you plan to develop your career along pro-

fessional or management lines, I hope that you will learn something of: One person is nothing more than a straw in the wind. The sooner you realize how insignificant you are, the brighter your career will be.

This is an easy concept to grasp when you think of management, but it is more difficult when you think of a professional career. Again, let us use Dr. DeBakey as an example. He works with a

small but highly skilled team of doctors and nurses. Let us assume that some morning only Dr. DeBakey arrived to operate. Nothing would happen. Even that great professional is helpless without a team.

Once you start to realize your own limitations, it is only natural for you to start surrounding yourself with men and women of greater capacity than you own. Then, and only then, will exciting things start to happen.

As you build your career, you must learn to attract and keep great people as a part of your team. Finding and attracting these people is difficult. Keeping them as part of your team is the key to your future.

How do you do this? Simply by creating and keeping an environment where their goals and dreams can also mature.

In EDS, we do a number of things to build and keep this environment. It is fragile. All

of us have to work at it very hard to keep it as the company grows. First, there is no seniority system. The best qualified person gets the top job. We constantly work to prevent company politics in EDS. We want men and women who wish to build their careers based on what they produce and who would not stoop to building their careers at the expense of others.

At EDS, we are dedicated to dealing with each person as an individual. There is only one class of employees at EDS. We do not tolerate one person looking down on another. We strongly discourage an atmosphere where one person would look up to another as a more important person, because we think that stifles free, open communication. Instead, we try to maintain an environment where each person deals with each person in our business as a full partner.

At EDS, we are dedicated to recognizing and rewarding excellence. We want to know who the top producers are. In every possible way, we want to recognize them for their unique contributions.

The most successful people

As a result of EDS's business success, I have had the opportunity to meet and get to know the men and women that you would consider among the most successful business people in the world today. I think you would be interested in knowing some of their characteristics.

First, there are no geniuses in this group. In terms of mental capacity, they would probably be ranked slightly above average. One characteristic stands out. These people are honest. They do what they say they will do. This causes other people to trust them, which creates an opportunity for these people to lead. Never forget, trust is fragile. It takes years to earn. It can be lost in an instant. It must be re-earned each time you have contact with another person.

Another characteristic of these successful people is that they have a great deal of self-discipline. They are able to stick to the task at hand. They realize that the more successful they become, the more unpleasant the tasks will be that they have to perform.

As an example, EDS has a brilliant team of men and women. All of the routine problems, and even the tough problems, are handled without my knowledge. By the time the problem gets to my desk, it has a reasonably defined solution. So, you can see that one of the "rewards" for building a successful business staffed with a great team is to earn the opportunity to spend most of

See SUCCESS page 69

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MANAGEMENT

CALENDAR

SEPTEMBER 7-13

Entity Modelling Techniques and Application. Washington, D.C., Sept. 8-10 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20864.

Technical Update Conference. — 86, Anaheim, Calif., Sept. 8-10 — Contact: Security Pacific Audit Services, Suite 208, 11865 Laurel Canyon Blvd., San Fernando, Calif. 91340.

NCC Telecommunications Conference. Philadelphia, Sept. 8-10 — Contact: American Federation of Information Processing Societies, 1899 Preston White Drive, Reston, Va. 22091.

Computing in the 21st Century. Bloomington, Minn., Sept. 9-10 — Contact: Charles Babbage Institute, University of Minnesota, 117 Pleasant St. S.E., Minneapolis, Minn. 55455.

Corporate Electronic Publishing Systems IV: A Conference and Show. Boston, Sept. 9-11 — Contact: Cahners Exposition Group, 909 Summer St., Stamford, Conn. 06905.

1986 Intelligent Building Conference and Exposition. Atlanta, Sept. 9-11 — Contact: Bryson Associates, 162 Tower Place, 3340 Peachtree Road N.E., Atlanta, Ga. 30305.

Midcon '86. Dallas, Sept. 9-11 — Contact: Midcon, 8110 Airport Blvd., Los Angeles, Calif. 90045.

Tenth Annual Disaster Recovery Planning Conference. Atlantic City, Sept. 10-12 — Contact: Devlin Associates, 430 Exton Commons, Exton, Pa. 19341.

Datasquest, Inc. Conference. San Diego, Sept. 11-12 — Contact: Computer Storage Industry Service, 1290 Rider Park Drive, San Jose, Calif. 95131.

Optical Storage and Retrieval. Hyannis, Mass., Sept. 11-12 — Contact: International Optical Telecommunications, 720 Main St., Hyannis, Mass. 02601.

SEPTEMBER 14-20

The Annual Policy and Planning Conference of the Electronic Funds Transfer Association. Washington, D.C., Sept. 14-16 — Contact: EFT Association, Suite 1000, 1726 M St. N.W., Washington, D.C. 20006.

CADDE — An Applied Data Research Users Conference. Nashville, Sept. 14-18 — Contact: Director of Client Relations, ADR, R.R. 206 and Orchard Road, CN-8, Princeton, N.J. 08540.

The MAF/TOP Users'

Group Meeting. Ann Arbor, Mich., Sept. 15-16 — Contact: Society of Manufacturing Engineers, Technical Activities Division, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

The International Videotex Industry Exposition and Conference. New York, Sept. 15-17 — Contact: VI Association, Suite 200, 1901 N. Fort Myer Drive, Rosslyn, Va. 22209.

Ninth National Computer Security Conference. Gaith-

ersburg, Md., Sept. 15-16 — Contact: Computer Security Conference, Attention: C421, NCSC, 8800 Savage Road, Ft. George G. Meade, Md. 20755.

Bypass: The Second Wave. New York, Sept. 16 — Contact: Conference Registrar, The Eastern Management Group, Four Century Drive, Parsippany, N.J. 07054.

Networld '86. Dallas, Sept. 16-18 — Contact: Novell, Inc., 748 North 1340 W., Orem, Utah 84067.

ersburg, Md., Sept. 15-16 — Contact: Computer Security Conference, Attention: C421, NCSC, 8800 Savage Road, Ft. George G. Meade, Md. 20755.

Bank EDF Audit Conference. Atlanta, Sept. 21-24 — Contact: Bank Administration Institute, 60 Gould Center, Rolling Meadows, Ill. 60008.

Electronic Computing Health Oriented. Palm Beach, Fla., Sept. 21-24 — Contact: St. Luke's Samaritan Health Care, Inc., 3000 W. Montana Ave., Milwau-

kee, Wis. 53215.

The Sixth Annual Conference on Control, Audit & Security of IBM Systems. Boston, Sept. 21-24 — Contact: MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

Datasertage '86. San Jose, Calif., Sept. 22-24 — Contact: Forum Management, Cartilage & Associates, Inc., Suite M259, 1101 S. Winchester Blvd., San Jose, Calif. 95128.

See CALENDAR page 72

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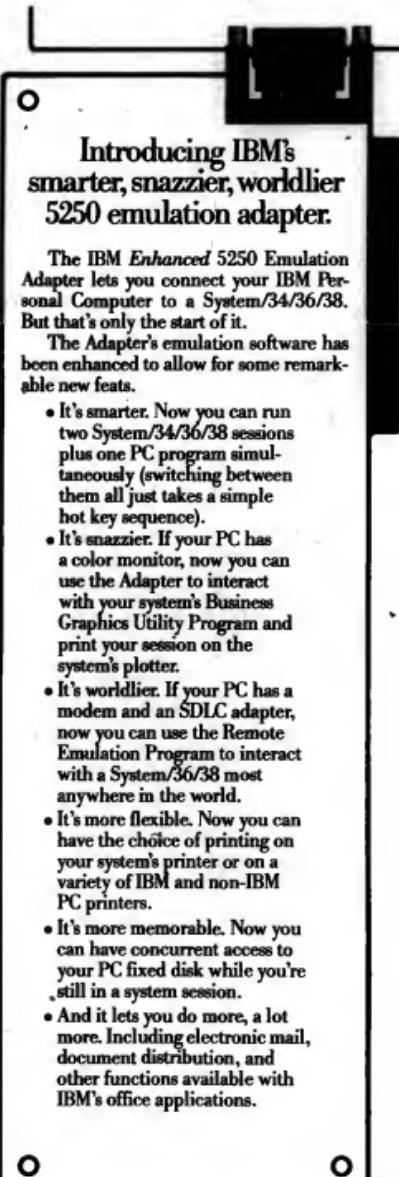


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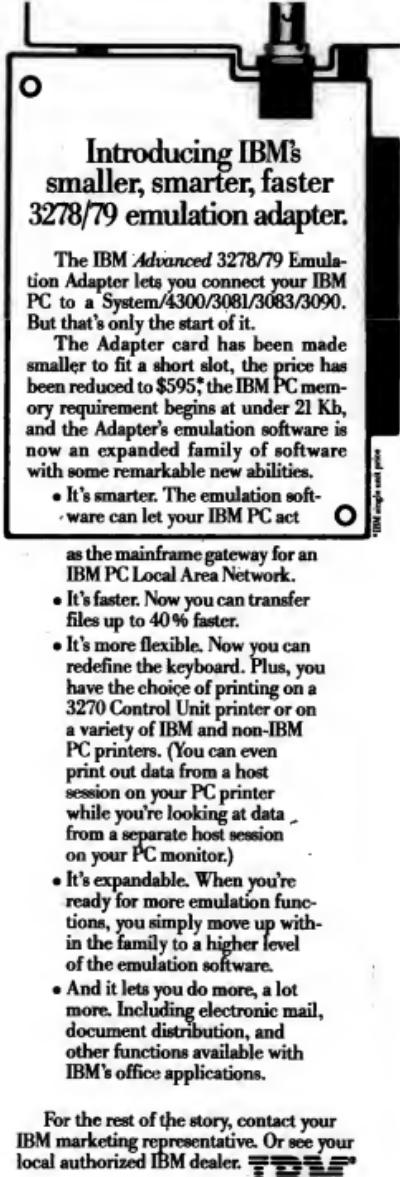


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- It's expandable. When you're ready for more emulation functions, you simply move up within the family to a higher level of the emulation software.
- And it lets you do more, a lot more. Including electronic mail, document distribution, and other functions available with IBM's office applications.

For the rest of the story, contact your IBM marketing representative. Or see your local authorized IBM dealer.



MANAGEMENT

Success in business

From page 66

your time working on the toughest problems facing the business. The most successful men and women develop the self-discipline it takes to do this and do it well.

Toughness or resilience is probably the most dominant characteristic I have observed in this group. These are people who have the ability to look onto a problem and pursue it through many disappointments and failures to a successful solution.

On occasion, I have felt the dismay and frustration characteristic of these people was simply that they couldn't recognize when they had failed, refused to quit, and went on to succeed. Again and again, you will find their brilliant business careers built squarely on the rubble of their early failures. They turned their early failures into learning experience.

As a group, these people take a tremendous amount of pride in what they are doing.

Watching them in action is fascinating. They know more about their particular industry than anyone else. As you watch them make decisions in making a judgment, you would first conclude that they are making intuitive decisions rather than carefully thought-out, logical ones.

In fact, these people are bringing the sum of their total prior experience to bear on a given problem. Their early successes, failures and disappointments are all focused on the problem at hand. The knowledge they have gained from their past experiences gives them the ability to decide quickly and accurately.

As a group, these people are extremely competitive. They love to finish first in whatever they are doing.

As much as I would like to, there is no point in trying to complete this speech with out talking about success in terms of money.

The best way to make money is not to have making money as your primary goal. Again and again, I've seen great people come into the business world primarily motivated to make money. Almost without exception, they failed. They missed the real essence of learning to do something well, of building something better than anyone else, and were constantly reaching with only one objective in mind — to make money.

Fortunately, because you

live in this country, if you learn to do something better than anyone else, you will find that financial success comes as a by-product. This has certainly been true in my case to a unique degree. Making money has never been one of my goals.

I can clearly remember how shocked I was in 1968 when I suddenly realized that, because the entire team that built EDS had built it so well, we had created an organization that could generously reward the people who created it and who continued to build it. If we had set out to use EDS simply as a vehicle to make money, I don't believe we would have been successful at all. Instead, we went out to build a great company made up of great people. The financial rewards came as a by-product.

Don't expect the financial rewards to come quickly or easily. You would probably consider me to be quite successful at an early age. It took me 15 years to build up to an income that exceeded our family's monthly needs. Unrealistic expectations can

experiences and observations of others. I have concluded that if a couple has problems when their income is modest and later reach financial success, the success only compounds their problems instead of eliminating them. Success causes the marriage to break apart, because with success comes many complications, placing additional stress on an already faulty relationship.

If you question what I am saying, I can prove my point simply by suggesting that you walk through some very explosive recruiting exercises to people who are wealthy. Look at their faces. Watch them. How many of them are having as much fun as you and your family have? I'll never forget my first visit to such a place. I concluded from my observations that happiness and financial success are unrelated.

Learning to manage your own money is an important step to success. The people I have met who have been extremely successful made it a point to save money in their early years, when their incomes were small. They avoided the temptation to splurge with young people today, of engaging in deficit spending. They realized the need to be financially sound and resisted the temptation to spend everything they made or to spend more than they made.

Over a period of time, these people were in a financial position to make prudent investments and take advantage of opportunities that came their way. Contrast their position to the young couple who is deeply in debt and, in effect, running on a treadmill just to make all the payments.

I wish there were some way that I could duplicate the experiences that I've had. I wish that each young person starting a business could share these same experiences, compressed into a much shorter period of time. I can clearly remember August 1967, when my wife and I drove into Dallas with everything we owned in the trunk of our car. We have been very fortunate since that time. I am hopefully reporting to you tonight, however, that we are not one bit happier as a result of financial success. The births of our five children brought us far more additional happiness than any of the unique experiences we have had as a result of business success.

In summary, based on my

nature causes us to lose interest in the things we do best, at our moment of greatest accomplishment.

Perhaps the easiest group to look at is the professional boxer. Starting out, the young fighter knows that he must undergo the drudgery of roadwork and training to keep his body in peak condition. Over a period of years,

your sense of balance, humility or the keen assessment of your strengths and weaknesses that you made years ago. Don't let yourself become a dilettante. Study the great corporations in this country. You will see that a common characteristic of these companies is that the people who created them had the self-discipline to stay with them and to continue building them over a period of many, many years.

The old saying, "Cobbler, stick to your last," that is, keep doing what you do best, is very true in business. Learn something. Do it well. Stick with it. Avoid distractions. Never forget who you are, and most importantly, never lose sight of those things you can't do.

In closing, to build a successful career, expect to be involved. You are out on the field, not in the stands.

Theodore Roosevelt summed it all up beautifully: "It is not the critic who counts, not the man who points out how the strong man stumbled, or where the doer of deeds could have done them better. He believes in the man who is actually in the arena; whose face is marred by dust and sweat and blood; who strives valiantly; who errs and comes short again and again; who knows the great enthusiasms, the great devotions; who spends himself in a worthy cause; who, at the best, knows in the end the triumph of high achievement, and who, at the worst, if he fails, at least fails while daring greatly."

As you become successful, you will need a great deal of self-discipline to not lose

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MANAGEMENT

CALENDAR from page 67

1986 World Congress on the Human Aspects of Automation, Long Beach, Calif., Sept. 23-24 — Contact: Public Relations Department, Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Leaders in Automotive Manufacturing, Detroit, Sept. 23-24 — Contact: Society of Manufacturing Engineers, P.O. Box 930, One SME Drive, Dearborn, Mich. 48121.

Computer-Aided Publishing '86 Exposition and Conference, Washington, D.C., Sept. 23-25 — Contact: CAP Association, Suite 200, 90 W. Montgomery Ave., Rockville, Md. 20850.

International Videocon Industry Exposition and Conference, New York, Sept. 23-25 — Contact: Cahners Exposition Group, P.O. Box 3833, Cahners Plaza, 999 Summer St., Stamford, Conn. 06904.

The Fourth Annual NCR User Education Conference, Atlantic City, Sept. 25-26 — Contact: ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

The Association for Women in Computing's Fifth Annual Conference, New York, Sept. 25-26 — Contact: ECUO Treasurer/Convention Publicity Chairman, c/o AOR, Inc., P.O. Box 429, Willow Grove, Pa. 19090.

St. Louis, Sept. 26-28 — Contact: AWC Conference '86, 407 Hillman Drive, Silver Spring, Md. 20901.

SEPT. 28-OCT. 4

1986 Society for Information Management Annual Conference, Dallas, Sept. 28 to Oct. 2 — Contact: 1986 SIM Annual Conference, P.O. Box 7030, Chicago, Ill. 60680.

National Communications Forum, Chicago, Sept. 29 to Oct. 1 — Contact: NCF, 505 N. Lake Shore Drive, Chicago, Ill. 60611.

Performance/Capacity Management Tutorial, Monterrey, Calif., Sept. 29 to Oct. 2 — Contact: The Institute for Information Management, Suite 230, 1901 S. Beacon Ave., Campbell, Calif. 95008.

Video Expo, New York, New York, Sept. 29 to Oct. 4 — Contact: Knowledge Industry Publications Inc., 701 Worcester Ave., White Plains, N.Y. 10604.

Products '86, Dallas, Sept. 30 to Oct. 1 — Contact: Future Computing, Inc., 8111 LBJ Freeway, Dallas, Texas 75251.

First National Desktop Publishing Trade Show, Chicago, Oct. 3-5 — Contact: The Personal Publishing Show,

P.O. Box 360, Itasca, Ill. 60143.

OCTOBER 8-11

Information Management Exposition & Conference, New York, Oct. 8-9 — Contact: Cahners Exposition Group, P.O. Box 5633, 999 Summer St., Stamford, Conn. 06905.

Computer and Communications Security '86, New York, Oct. 7-9 — Contact: Show Manager, Cahners Exposition Group, P.O. Box 5080, 1350 E. Touhy Ave., Des Plaines, Ill. 60017.

PC Expo, Chicago, Oct. 7-9 — Contact: 333 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Despo West '86 Show, San Francisco, Oct. 7-10 — Contact: Exposonic International, Inc., 5 Independence Way, Princeton, N.J. 08540.

Laurex '86, Boston, Oct. 9-11 — Contact: P.O. Box 3415, Indianapolis, Ind. 32903.

OCTOBER 12-18

National Office Automation Conference, Washington, D.C., Oct. 14-16 — Contact: NOAC, P.O. Box N, Wayland, Mass. 01778.

Optical Publishing '86.

New York, Oct. 15-17 — Contact: Learned Information, 143 Old Marton Pike, Medford, N.J. 07945.

Scan-Tech '86, San Francisco, Oct. 15-17 — Contact: Automatic Identification Manufacturers, Inc., 1326 Freeport Road, Pittsburgh, Pa. 15236.

IBM, AT&T and Alternative Suppliers Telecommunications Strategies, Washington, D.C., Oct. 16-17 — Contact: Phillips Publishing Inc., 7811 Montrose Road, Potomac, Md. 20854.

OCTOBER 19-25

Third Party and Self Maintenance Conference, New York, Oct. 20-21 — Contact: Frost & Sullivan, Inc., Department RE-828 E, 106 Fulton St., New York, N.Y. 10038.

Informatics '86, Toronto, Oct. 20-25 — Contact: International Information Management Congress, P.O. Box 34044, Bethesda, Md. 20817.

OCT. 26-NOV. 1

International Data Corp.'s MIS Executive Conference, Palm Springs, Calif., Oct. 26-29 — Contact: IDC, 5 Speen St., Framingham, Mass. 01701.

The Annual Teleconference Users Conference, San Jose, Calif., Oct. 27-29 — Contact: Applied Business Telecommunications, Box 5106, San Ramon, Calif. 94583.

Hammer Forum '86, Cambridge, Mass., Oct. 27-29 — Contact: Hammer and Five Cambridge Center, Cambridge, Mass. 02142.

Distribution Computer Expo '86 East, Parsippany, N.J., Oct. 28-30 — Contact: C.S. Report, Inc., P.O. Box 463, Exton, Pa. 19341.

NOVEMBER 2-8

Fall Joint Computer Conference '86, Dallas, Nov. 2-6 — Contact: FJCC '86, 1730 Massachusetts Ave., N.W., Washington, D.C. 20036.

The Automated Manufacturing Exhibition and Conference, Greenville, S.C., Nov. 3-6 — Contact: P.O. Box 5616, Greenville, S.C. 29606.

Electrostatic Imaging '86, Boston, Nov. 5-6 — Contact: MG Expositions Group, 1050 Commonwealth Ave., Boston, Mass. 02215.

North American Telecommunications Association Convention & Exhibition Showcase, St. Louis, Nov. 5-7 — Contact: NATA, Suite 550, 2000 M St. N.W., Washington, D.C. 20036.

We Need Software!

The Royal Hong Kong Jockey Club is a non-profit organization with sole responsibility for the administration and operation of all racing, horseracing and lottery systems in Hong Kong. Sums of funds are donated to charities and granted to organizations for the benefit of the Hong Kong public. The general dimensions of the organization are:

- Annual turnover (fiscally), US\$2.7 billion
- Staff: permanent 3,700, part-time 9,000
- Total revenue assessment of US\$100 million
- Club membership, 21,000
- Facilities: over 100 racing courses with capacity for 70,000, an international equestrian center, race meets, motor-racing, clubhouse, suitable for 950 horses, organic hospital, 128 Off Track Betting Centers, etc.

Objectives of Information Systems Project

- To control and reporting activity from the management preventing racing systems via the corporate financial and administrative areas.
- To provide authorized users with an integrated response system, which is both to the highest standards of performance, reliability, security, audit and recoverability.
- To meet our business service applications: Payroll, General Ledger, Fixed Assets, Membership Accounting, Accounts Payable, in house, within a 2-year timeframe.
- To stay within the established systems environment.
- To obtain a packaged solution from a vendor who is willing to take prime responsibility for the components.

Requirements Summary

- The following packages are required:
 - Field Assets, General Ledger
 - Accounts Payable/Receivable
 - Payroll, Fixed Assets
 - Inventory Management
 - Human Resource Management
 - Property Management
 - Hospitality/Membership Services
 - Donor Management
 - Donor Security Management
 - Audit and Quality Assurance tools
- A proposed relational data base management system and an integrated data base system.
- Packages should interface in the RDBMS or via VAX/VMS file structures.
- A comprehensive customer education and support proposal which emphasizes significance on site support.
- Packages must be integrated or capable of being integrated so that the data flow between them is bidirectional and automatic.
- A proposal on migration strategy from existing packages to new packages.

Systems Environment

The Club has a commitment to Digital Equipment Corporation via the largest regional, established of VAX processors with VAX/VMS as a clustered environment.

In the event that acceptable software solutions are not forthcoming, the Club may consider alternative hardware solutions.

Logistics — Bidding Process

- Potential vendors must register interest via Facsimile or tele by 3 p.m. HK time, on 10-OCT-86, as below:
 - Ass: Computer Services Committee
 - Ref: Computer Services Proposal
 - Title: 10341 RIBLIC HK
 - Fax: (852) 523-3379
- Qualified vendors will be forwarded a detailed information package by 10-NOV-86.
- All responses are unsecured. In writing by fax, and responses which are generally applicable to all parties will be distributed accordingly.
- Following initial evaluation, a short list of potential vendors will be formed. The short list will be invited to give formal presentation which may be followed by demonstration and discussion.
- The successful vendor to vendors will be required to sign the Club's Standard Purchase Agreement, a draft of which will form part of the information package.



The Royal Hong Kong Jockey Club

NEW PRODUCTS

Talaris mixes text, graphics on terminal

A terminal that combines alphanumeric, graphics and bit map capabilities has been introduced by Talaris Systems, Inc. of San Diego.

The terminal, called Talaris 7800, is available now at a price of \$2,890, according to a company spokesman.

The Talaris 7800 reportedly features Tektronix, Inc. 4014 emulation for graphics; Digital Equipment Corp. VT220 keyboard and VT220 emulation for alphanumeric text input; and a bit-mapped display with a resolution of 1,024 by 780 pixels in a 14-in. monitor.

The terminal also has 30 proportionally



Talaris 7800 terminal

spaced resident fonts and can be configured by the user to store up to 300K bytes of font bit maps that are downloaded from the host computer.

To accompany the terminal, Talaris has written a page previewing program, called Pretext, for users of the Tex computerized typesetting language. Pretext is priced at \$750.

According to a Talaris company official, the terminal combined with the software gives users the capability to integrate text and graphics on the screen and to view proportionally spaced text with the same typefaces they will see when they print the final page.

Pretext is said to include all the computer modern fonts that match those in Talaris's TeXpsuitor software for its laser printers. The Talaris 7800 not only allows page previewing from typesetting software but also serves a variety of graphics applications, the vendor stated.

The Tektronix emulations provide graphics software compatibility with a range of graphics software. Vector graphics from other software programs that support the Tektronix 4014 can be scaled and merged with text. For previewing the page on the terminal, the user processes the device-independent file using Pretext. For printing on a Talaris printer, the user processes the device-independent file using Odrite, Talaris's text and graphics integration package.

The 7800's Tektronix emulation supports point plot, incremental plot, patterned lines and four character sizes in hardware. Other graphics features include true pan and zoom, up- and downloading of raster graphics including fonts, a cross-hair cursor and automatic coordinate scaling.

Engineers serving real-time systems get PC workbench

Index Technology Corp. of Cambridge, Mass., has released Excelsior/RTS, a personal computer-based design workbench for engineers developing real-time systems. It reportedly provides integrated graphics, analysis, reporting, documentation and screen and report design facilities for the design of systems with time and control processing requirements.

Excelsior/RTS offers data processing analysis and design diagrams, such as data flow diagrams, structure charts and diagrams, entity relationship models and presentation graphs, that are used in the base Excelsior product, a company spokesman said.

In addition, Excelsior/RTS is said to support the following four graph types developed especially for real-time systems design: transformation graphs, also known as context diagrams, which show the flow of data and control within a system; state transition diagrams, which show the conditions and actions causing a change of state in a control process; matrix diagrams, which present conditional logic for decision tables or other diagrams; and block diagrams, which show signal flow between system hardware and software.

Excelsior/RTS, available now, is priced at \$8,400 for single copies, with volume discounts available. It runs on the IBM Personal Computer XT and AT, the AT&T Personal Computer 6300, Compaq Computer Corp. Portable 286 and compatibles with 640K bytes of memory, a high-resolution graphics board and a mouse.

Excelsior/RTS offers the capabilities needed to design and document almost any complex or embedded system, including those used in aerospace companies, process control, communications and system software, a company official stated.

Key components of the workbench include a graphics facility that XLDictionary, in which the graph relationships are stored, modified, tracked and analyzed; a screen and report painting facility to design a user interface and to test it through data entry and reporting; and the XLDB interface, which allows data to be shared among design team members, projects and host-based dictionaries.

Index Technology also developed Excelsior for designing conventional data processing systems and XL/Design Integrator, a related product available on Digital Equipment Corp. VAX computers.

NEC tool builds board fluency

NEC America, Inc. of Melville, N.Y., has released Version 1.1 software for the company's SAR-10 Voice-Plus, a voice-recognition and audio-response board.

The SAR-10 Voice-Plus is said to be a fully integrated part in board for the IBM Personal Computer and compatible computers. Through a menu, users can reportedly create a vocabulary that defines spoken inputs, keyboard characters for output as well as special functions and word group assignments.

Voice-Plus is capable of recognizing 250 phrases and provides an additional 250 audio output messages, according to a NEC America spokesman.

The system plugs into any system stan-

dard bus slot and provides transparent utility programs during application software execution, according to the NEC America spokesman.

Version 1.1 software reportedly provides a number of features including improved audio output sampling frequency for additional messaging capability, autorouting voice-loader routing, vocabulary file name defaults, enhanced recognition and response functions and additional status displays. There is also a basic program for diagnostics and testing, according to the vendor.

Voice-Plus comes complete with board, Version 1.1 software and documentation. The package costs \$599.

On-line bulletin board debuts for Ramis II

Runs via Compuserve on IBM mainframe

Martin Marietta Data Systems of Princeton, N.J., has initiated an on-line bulletin board for its Ramis II fourth-generation language and data base management system users. The bulletin board provides communication among users as well as between users and Martin Marietta, a spokesman said. The software runs on IBM mainframes.

The Ramis II bulletin board, said to have been developed in response to Ramis II users' requests, is offered through Compuserve, Inc., an on-line information services company based in Columbus, Ohio. The service, called Forum, is available

to all Ramis II users at a cost of \$2 per access hour, in addition to basic Compuserve charges.

In order to use Ramis II to access the bulletin board, they must have an account with Compuserve and be registered with Martin Marietta Data Systems Computer Service. The account with Compuserve is available through the purchase of a Universal Sign Up Subscription Kit from the company or from computer retail stores for \$39.95.

According to Compuserve, in addition to the Subscription Kit, users must pay the cost of connect times, which is based on a bit/sec. rate and the time of day when the service is used. A 300 bit/sec. rate costs \$12.60 per hour on weekdays. The cost is \$6 per hour during eve-

nings and all day on weekends and holidays.

The kinds of information available on the bulletin board are said to include general information on the purpose of Forum, product information, support information such as education and hot-line news and a directory of Martin Marietta Data Systems offices.

According to a Martin Marietta spokesman, other kinds of information available in the bulletin board are guidelines for "how-to" articles that can be submitted by either Martin Marietta or client personnel, messages from the company's engineering staff about special situations that may lead to incorrect or unintended results and maintenance releases from engineering that contain updates for Ramis II.

INSIDE

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Where IBM's
DB2 Relational DBMS
Falls Short...

Cincom's SUPRATM Soars.



SUPRA from Cincom[®] is the all-new advanced relational data base management system that soars free from the weaknesses that continue to haunt DB2 from IBM.[®]

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In fact, SUPRA's innovative *three-schema architecture* allows it to fly high above and beyond any relational system now on the market.

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NEW PRODUCTS/SOFTWARE & SERVICES

SOFTWARE
& SERVICES

Systems software

Software Techniques, Inc. has released Diskit/VMS Version 4.4 system software for Digital Equipment Corp. VAX computers.

Diskit/VMS Version 4.4 is said to offer VAX system managers a solution to disk fragmentation. The software provides a data service unit utility, which is said to improve the overall system by reducing the number of files in place on the disk. Diskit/VMS improves disk access speed by optimizing file extent sizes, creating contiguous files and by positioning both directories and frequently used files for quick access.

Diskit/VMS also includes XDRM, a

directory tool that allows extended search capabilities and command file generation, and Process, which is a process monitor that allows display of information on files.

Diskit/VMS costs \$3,950 for a VAX and \$2,500 for a Microvax II. Software Techniques, 6600 Katella Ave., Cypress, Calif. 90630.

Applications packages

Sundstrand Computer Services Co. has announced Fastform 4.0, the latest release of its direct data entry software system for the IBM VM/CMS environment.

Key features of Fastform 4.0 include native CMS and CMS-DOS compatibility, supporting both OS and DOS user exit programs; batch control, totaling and balancing; operator statistics; and the ability to present

help screens at the data-field level.

Additionally, Fastform 4.0 supports REXX language exit programs and provides the ability to switch from one screen format to another dynamically or in a specific sequence. It also features data duplication within and between records.

Fastform 4.0 costs \$12,000. Sundstrand Computer Services, 1286 Drummer Lane, Wayne, Pa. 19087.

■

New Generation Software, Inc. has introduced the Payroll system for the IBM System/38.

The Payroll system is said to feature computation of pay by hourly rate, fixed salary plus overtime and/or lump-sum payment; individual tailoring of deductions and contributions; extra earnings, deductions and

contributions by employee bargaining group and/or cost center; complete on-line validation prior to payroll calculation; and reliable audit trails.

The Payroll system costs \$25,000. New Generation Software, 3840 Rosin Court, Sacramento, Calif. 95834.

■

Bell & Howell unveiled its Power+ DOD Accounting Package and Power+ Cost Accounting System, designed to support IBM Communications-Oriented Production Information and Control System's Manufacturing Resource Planning II.

The Power+ DOD Accounting Package is said to let users collect, track and report product costs. The package provides preliminary budget reporting, job ledger data base operations and job ledger reporting capabilities. The Power+ DOD Accounting Package costs \$20,000.

Power+ Cost Accounting is said to include actual cost tracking and reporting capabilities. The Power+ Cost Accounting Package costs \$35,000.

Bell & Howell, 2231 W. Howard St., Evanston, Ill. 60202.

■

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I

Uccel Corp. has announced Release 2.8 of UCC-7 Automated Production Control System, which runs under both the MVS and MVS/XA operating systems.

Release 2.8 includes a revised data base format that reportedly cuts in half the amount of time required to access the UCC-7 data base, condition code-checking capabilities and automated recovery facilities that reduce the time required to recover from hardware failures.

Release 2.8 costs from \$39,000 to \$65,000, depending on options.

Uccel, Uccel Tower, Exchange Park, Dallas, Texas 75235.

■

P-Stat, Inc. has ported its P-Stat software package to AT&T's Unix PC Model 7300.

Said to be designed for managing and analyzing data, P-Stat combines data and file management, data display, statistical analysis, survey analysis and report writing capabilities. P-Stat reportedly features an online Help facility, an interactive editor, flexible data entry and validation, relational data base capabilities, macro and a range of statistical procedures.

P-Stat for Unix PCs costs \$995. P-Stat, P.O. Box AB, Princeton, N.J. 08542.

■

Excalibur Sources, Inc. has released a multiserver version of Excalibur, the company's automated sales and telemarketing software.

The version is said to incorporate features designed to take advantage of the AT&T Unix and Microsoft Corp. Xenix operating systems, including a multilevel scripting system for telemarketers and advanced management reporting capabilities.

The multilevel version of Excalibur costs \$1,000 and up, depending on configuration.

Excalibur Sources, P.O. Box 467220, Atlanta, Ga. 30346.

■

NEW PRODUCTS/SOFTWARE & SERVICES

Response, Inc. has introduced its **Response Retail Management System** for the computer retail industry.

The Response Retail Management System has operator support record-keeping functions, said to allow multiple-company tracking for hardware warranties and software support agreements.

The system also reportedly offers a comprehensive Financial and Distribution Management System for a computer retail store, inventory, including serial number tracking in multiple warehouses, sales analysis, billing, payroll, point of sale, mailing list and potential customer tracking and sales representative calls.

The system operates on the IBM System/36 family, including the System/36 Personal Computer.

The Response Retail Management System costs \$6,995.

Response, P.O. Box 66, 608 2nd St., Jackson, Minn. 56143.

Languages

Unipress Software, Inc. has introduced **Unishell**, a Bourne shell script compiler.

Unishell reportedly analyzes a shell script, translates it into the C language, compiles it and then produces executable programs.

Unishell is available for a wide range of computer systems, according to the vendor.

Unishell for a personal computer-style machine costs \$395; for workstations, \$695; for Digital Equipment Corp. VAX 750 and 780 machines, \$995; and for supermicrocomputers, \$2,500.

Source code is available for any size machine at a price of \$4,995.

Unipress Software, 2025 Lincoln Highway, Edison, N.J. 08817.

Utilities

VM Software, Inc. has announced **VMoperator** and **VMbatch** software for IBM's VM environment.

VMoperator is said to enhance the interface between VM and the data center operations staff. The full-screen product supports 3270 Personal Computer-class displays. Features include the highlighting of important messages and hard-copy capabilities.

VMbatch reportedly allows a VM user to engage his own machine in interactive work while performing unattended tasks on one or more batch worker virtual machines. Users can query, submit, cancel and monitor batch jobs in the VMbatch system.

VMoperator costs \$9,000, and **VMbatch** costs \$8,000.

VM Software, Suite 365, 2070 Chain Bridge Road, Vienna, Va. 22180.

Precision Visuals has announced its **Enter/Act User Interface Management System (UIMS)** for technical software developers.

Enter/Act UIMS reportedly handles all application aspects of the user/computer interface, including prompt/command interaction, data entry or action menus and both alphanumeric and graphics windows. It is said to allow application prototypes to be implemented in days rather than months.

Enter/Act, initially designed to run under Digital Equipment Corp.'s VMS, is now machine independent

and can run on any device with alphanumeric capabilities similar to those of DEC's VT100.

Enter/Act costs \$20,000 for the initial development license.

Precision Visuals, 6250 Lookout Road, Boulder, Colo. 80301.

Boston Systems Office, Inc. has released **BSD/C** compiler with debugging support for the Motorola Inc. 68000, 68010 and 68020 family of microprocessors.

BSD/C compiler is said to include features such as sophisticated address masking, efficient register management and branch optimization. With the debugging support, C programs for the 68000 can be debugged right on the VAX. **BSD/Debug** is said to allow the user to trace and

execute C source lines and labels for more accurate software development.

BSD/C compiler for the Motorola 68000, 68010 and 68020 family is priced from \$5,000.

Boston Systems Office, 128 Technology Center, Waltham, Mass. 02254.

Data base management systems

Data Language Corp. has introduced **Progress Test Drive**, a demonstration package said to offer all the features and capabilities of the firm's Progress fourth-generation relational data base management system.

Progress Test Drive includes a complete order-entry application that quickly demonstrates Progress's performance for transaction process-

ing applications, according to the vendor. Other Progress features included in **Test Drive** are easy modification on a flexible relational data base, crash-proof recovery from hardware, software and environmental failures and variable-length fields and records reportedly resulting in faster sequential processing.

Progress Test Drive costs \$50.

Data Language, 47 Manning Road, Billerica, Mass. 01821.

MICROCOMPUTERS

Software utilities

Aspen Research, Inc. has announced **Enter/3270**, an IBM Personal Computer-based data entry subsystem said to bring local front-end

Continued on page 78

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Japanese computer buyers are targeting U.S.-made products!

Japan, the world's largest computer market outside of the U.S., is eliminating all import tariffs on computers, peripherals, and parts during 1986 in order to relieve Japan-U.S. trade pressure. In fact, the Japanese are aggressively buying U.S.-made products in response to Prime Minister Nakasone's directive to "buy American."

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NEW PRODUCTS/MICROCOMPUTERS

Continued from page 77
processing to existing mainframe applications.

With Enter/3270 users can add local format storage, on-line Help, local data capture, display screen customization, keying assistance and extensive data validation to unmodified IBM 3270-based mainframe applications.

Enter/3270 costs \$500 per workstation.

Aspen Research, 773 El Cerrito Ave., Hillsborough, Calif. 94010.

Goldata Computer Services, Inc. has announced the Help module software package, designed to aid software developers using IBM Personal Computer and compatibles to build on-line Help.

Help features include user-defined window sizes, tiled window capability, multiple window border types and user-defined speed at which windows appear.

The software is parameter driven and memory resident and is compatible with most languages and software products, including C, Cobol, Ashton-Tate's DBase and Lotus Development Corp.'s 1-2-3.

Help costs \$69.95 for a one-user runtime license.

Goldata Computer Services, 2 Bryn Mawr Ave., Bryn Mawr, Pa. 19010.

Software data base management systems

Business Tools, Inc. has enhanced its TAS-Plus programmable relational data base.

TAS-Plus allows users to create, add, change and delete data base records without writing a program. A browse utility allows users to display multiple records and manipulate data. TAS-Plus allows users to create data management applications by using the screen painter, the traditional text editor or through the use of TAS-Plus source code editor.

TAS-Plus requires an IBM Personal Computer, Personal Computer XT, AT or compatible running Microsoft Corp. MS-DOS 2.0 or higher.

TAS-Plus costs \$69.

Business Tools, Suite 266, 4038-B 128th Ave. S.E., Bellevue, Wash. 98006.

Software enhancements

Microsystems, Inc. has released Uniform-PC Version 2, said to permit use of more than 110 non-IBM Personal Computer disk formats on a standard Personal Computer XT and more than 160 formats on a PC AT.

Version 2 gives users the ability to read, write and initialize disks from most of the Digital Research, Inc. CP/M and Microsoft Corp. MS-DOS computers. Features include the ability to set a default drive, support for Apple Computer, Inc.'s Softcard, CP/M and North Star Corp.'s CP/M hard sector formats — when used in conjunction with the new Matchpoint-PC card — and support for MS-DOS formats from computers that do not use IBM standards.

Version 2 costs \$69.95.
Microsystems, 125 S. Fourth St., DeKalb, Ill. 60115.

Inmagic, Inc. has announced Inmagic Version 7, a text-oriented data base management system.

Inmagic Version 7 offers full-screen editing, password protection for field- and function-level security and basic arithmetic functions, including counts and totals. Inmagic Version 7 accepts information in variable-length fields with no size limitation.

Inmagic Version 7 for the IBM Personal Computer XT, AT and compatibles costs \$975 in single-unit quantities.

Inmagic, 238 Broadway, Cambridge, Mass. 02139.

Access Data Systems, Inc. has enhanced its Auditor callback security system.

Auditor reportedly was designed to secure dial-in access at central data centers with multiple secure-access modes. Independent of modem types or system protocols, Auditor features increased audit-log reporting capability with 42 basic messages and internal storage of up to 6,000 records. It also has multiple identification, time and port restrictions and assignable security levels.

Auditor costs \$4,150.

Access Data Systems, 766 Big Tree Drive, Longwood, Fla. 32750.

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Inmagic Systems, Inc.
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LeBaugh Software Corp. has released Version 1.1B of its Leprint software for dot matrix or laser printers.

Version 1.1B supports 31 additional dot matrix printers and is said to work twice as fast on laser printers. Leprint software is said to bring near-letter-quality printing and type-set quality to dot matrix and laser printers. The software works on IBM Personal Computers and compatibles. Version 1.1B has a minimum recommended computer memory of 256K.

Leprint Version 1.1B is priced at \$149.

LeBaugh Software, 2720 Greene Ave., Omaha, Neb. 68147.

Meridian Technology, Inc. has released Carbon Copy Version 3.0, a remote-control communications software package for IBM Personal Computers, Personal Computer XTs, Personal Computer ATs and compatibles.

Carbon Copy reportedly links together two PCs over an asynchronous communications link so that the two act as one.

Version 3.0 of Carbon Copy includes features such as remote printer support with conversion utility, dial-back security, log file with complete audit trail, automatic log-in through the addition of passwords to the call table, a host connection providing access in and out of IBM PC/DS without losing data link and modem and line status display.

Version 3.0 costs \$195.

Meridian Technology, Suite 120, 9201 Dove St., Newport Beach, Calif. 92660.

Communications

Hayes Microcomputer Products, Inc. has introduced Interbridge, a local and remote connection for expanding Apple Computer, Inc.'s AppleTalk Personal Networks.

Interbridge was designed to connect several AppleTalk Personal Networks to improve access from one network to another. Interbridge is equipped with two AppleTalk DE-95 ports and two RS-232C ports, which may be activated simultaneously. Interbridge costs \$799.

Hayes Microcomputer Products, 705 Westtech Drive, Norcross, Ga. 30092.

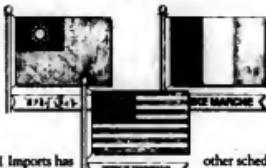
Coefficient Systems Corp. has announced VTerm/230, a Digital Equipment Corp. terminal emulation software package.

VTerm/230 is said to allow communication between IBM Personal Computers and compatibles and DEC VAX, Microvax and PDP-11 computers. VTerm/230 features include automatic reformatting of host files for insertion into Lotus Development Corp. 1-2-3 and Ashton-Tate DBase, customized keyboard mappings and multilingual character set capabilities.

VTerm/230 is priced at \$245.

Coefficient Systems, 611 Broadway, New York, N.Y. 10012.

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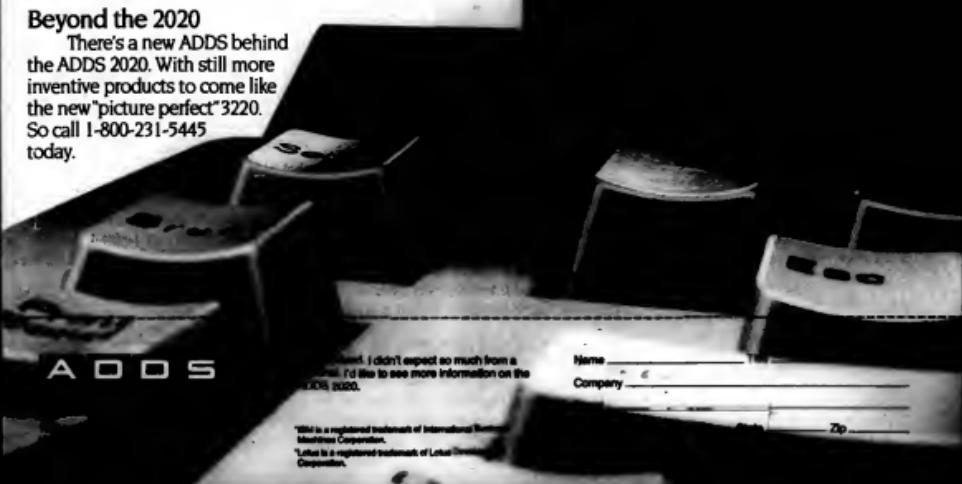
You've never expected 44 programmable keys with 88 modes and over 2500 characters of non-volatile memory to support them. Never expected it because the ADDS 2020 is the first terminal to give it to you.

The ADDS 2020 keyboard gives you a legend strip and the satisfying feel of solid quality. And if you like your PC keyboard, keep it. With the ADDS 2020 you can use IBM PC* compatible keyboards, even IBM's.

Greater expectations: The 2020 provides Lotus*-like menu bar assistance for function keys and applications; available desk accessories include a clock, calendar, calculator and telecommunications; a printer port for either serial or lower-cost parallel printers; and bell volume programmable from the keyboard or host. And, as superior as this new terminal is, it is still fully compatible with ADDS, Hazeltine, Lear Siegler, TeleVideo, Wyse and many other terminals.

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NEW PRODUCTS/MICROCOMPUTERS

Data storage

Western Automation has announced the Pre-Star series of memory, storage and random-access memory (RAM) disk products for Texas Instruments, Inc.'s Business Pro computers.

RAM modules that attach to the motherboard of the Business Pro are available in 128K-byte increments.

There is a Pre-Star RAM drawer that occupies the memory shelf of the computer and houses up to 3M bytes of expansion modules sold in 512K-byte increments.

128K-byte RAM board modules cost \$125. The RAM drawer with 512K bytes costs \$495, and 512K-byte upgrades cost \$325.

Western Automation, 1700 N. 56th St., Boulder, Colo. 80301.

expanded memory. Memek does not require the user to set DIP switches or adjust board jumpers.

Memek with 256K bytes of memory costs \$645; Memek with 1M byte costs \$795; and Memek with 2M bytes costs \$1,140.

Boca Research, 6401 Congress Ave., Boca Raton, Fla. 33431.

Milpitas, Calif. 95035.

COMMUNICATIONS

Controllers

Renex Corp. has released TMS-one EP, an enhanced version of its asynchronous communications controller.

TMS-one EP is said to support multiple hosts and permit direct connection of ASCII devices to the CPU. The controller's emulation of IBM's 3270, 3290 and 3781 allows users to communicate in Binary Synchronous Communications, Systems Network Architecture, Synchronous Data Link Control or Async concurrently. The user can choose a menu from more than 150 Async terminals.

The TMS-one EP costs \$500. Renex, 1613 Davis Road, Woodbridge, Va. 22192.

Ideassociates, Inc. has introduced Diskit 2 Plus, a compact external Winchester drive for the IBM Personal Computer XT and AT.

Diskit 2 Plus has twin 10M-byte removable drives and offers three types of on-line backup including image backup of all data from one external cartridge to the other, image backup from an internal drive to an external Diskit 2 Plus cartridge and file-by-file backup.

Diskit 2 Plus is said to provide 11,000 power-on hours as well as encryption for data security.

Diskit 2 Plus is priced at \$3,500. Ideassociates, 29 Dunham Road, Billerica, Mass. 01821.

Printers/
Plotters/Peripherals

Facit, Inc. has announced D2000, a letter-quality printer for IBM Personal Computers and compatibles.

The D2000 is said to employ a soft-parameter setup in which Yes and No keys found on the printer panel allow operators to change print parameters by responding to the printer's questions. Other features of the D2000 include a low noise level and automatic paper-feed capability.

The D2000 also produces print in either unidirectional or bidirectional mode, depending on setup or interface requirements.

The D2000 is priced at \$965.

Facit, 9 Executive Drive, Merrimack, N.H. 03064.

Hattori Seiko Computer Peripherals has introduced its Selkkocon MP-1300AI dot matrix printer.

The MP-1300AI is said to have a print speed of 300 char./sec. Some features of the MP-1300AI include automatic cut-sheets, paper loading and rear and bottom feed of fanfold paper.

The MP-1300AI costs \$799; with a color option it costs \$964.

Hattori Seiko Computer Peripherals, 1111 MacArthur Blvd., Mahwah, N.J. 07430.

Board-level devices

Boca Research, Inc. has announced its Memek four-in-one board for IBM Personal Computers and compatibles.

Memek is an expanded memory specification product said to allow control over the allocation of memory between video, system and ex-

panded memory. Memek does not require the user to set DIP switches or adjust board jumpers.

Director Technologies, Inc. has introduced the Disk Defender, a hardware write-protect device for fixed Winchester disks.

Disk Defender is said to create a hardware barrier that makes it impossible to accidentally remove, destroy or update any file in the protected portion of the disk.

It includes a circuit board that can be installed in either the short or long slot of the IBM Personal Computer, Personal Computer II and compatibles, the control box, IBM PC-DOS/Microsoft Corp. MS-DOS partitioning software and installation program.

Disk Defender costs \$185.

Director Technologies, P.O. Box 7067, Evanston, Ill. 60204.

Univation, Inc. has introduced its Dream Board, a three-in-one multifunction board for use with IBM Personal Computers and compatibles.

The Dream Board provides two I/O ports, a clock/calendar and system accelerator capabilities said to increase processing speed by two to four times.

The Dream Board costs \$795. Univation, 1231 California Circle,

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Dianne Keams
Director of Marketing
Leverage Associates, Inc.
Minneapolis, Minn.



Leverage Associates, Inc. develops a full range of accounting, personnel and payroll software packages for mid-size companies with Burroughs and IBM mainframes as well as 32M System/36s. When Dianne Keams, Director of Marketing, started an awareness campaign for Leverage, she chose Computerworld.

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Novell will sponsor evening events for attendees and exhibitors at NetWorld, including a lively Mexican Fiesta in the Infomart Atrium on September 16.

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System vendor

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AE: Microcomputer hardware

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AG: MIS manager

AH: MIS manager

AI: MIS manager

AJ: MIS manager

AK: MIS manager

AL: MIS manager

AM: MIS manager

AN: MIS manager

AO: MIS manager

AP: MIS manager

AQ: MIS manager

AR: MIS manager

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IT Product Lines Offered

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A3: Workstations

A4: Microcomputer software

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A8: Networking

A9: Servers

A10: Super/Accessories

A11: Other _____

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NEW PRODUCTS/COMMUNICATIONS

Protocol converters

Renex Corp. has introduced its Bi-path reverse protocol converter equipped with a soft switch.

Bi-path reportedly allows the IBM 3270 family of display stations to emulate industry standard ASCII terminals as well as perform normal 3270 operations. Bi-path supports full keyboard emulation, full-speed capability up to 19.2K bit/sec. and scrolling. The soft switch allows users to enter and leave sessions with outside ASCII sources without having to manually activate the switch.

The stand-alone model of Bi-path costs \$695.

Renex, 1513 Davis Road, Woodbridge, Va. 22192.

■

May-Craft Information Systems, Inc. has announced the May-Craft 55 Remote protocol converter.

The 55 Remote is said to allow up to nine ASCII terminals, personal computers, printers or modems to connect to an IBM System/34, 36 or 38 host over RS-232 lines. The 55 Remote appears to the host as a 5251 Model 12 cluster controller. It is available in three-, five-, seven- or nine-channel units, and its any-channel can be configured to support any mix of ASCII CRT terminals or printers.

The 55 Remote costs from \$3,000 for the three-port standard to \$6,000 for the nine-port deluxe.

May-Craft, 4312 Beltwood Pkwy. S, Dallas, Texas 75244.

Software

Telios Systems Corp. has introduced a VAX Networking Interface for use with its EDA-700 design workstations and Digital Equipment Corp.'s VAX CPUs.

The VAX Networking Interface is said to permit direct file transfer between Telios workstations and a VAX, allowing users to tap VAX-based resources for mass storage, master library archival and file management. Used to facilitate downstream test and manufacturing applications, the interface can also be used to link the VAX as a gateway, enabling other environments to use Telios' testing data directly.

The VAX Networking Interface costs \$5,500.

Telios Systems, Two Omni Way, Chelmsford, Mass. 01824.

Multiplexers/Modems

Fibertronics International, Inc. has introduced its FM3299 eight-port coaxial multiplexer.

The FM3299 is said to allow up to eight remote peripherals to access IBM 3274 Category A and Memorex Corp. controllers over a single coaxial cable. The FM3299 attaches to the adapter of an IBM 3274 controller via a coaxial connector.

Data reported can be transmitted up to 10,000 feet between controllers and Type A terminals, printers or plug compatibles.

The FM3299 is priced at \$800.

Fibertronics International, 3225 Stevens St., Hyannis, Mass. 02601.

Canoga-Perkins has introduced the 3272, an 16- to 144-channel fiber-optic multiplexer.

The 3272 reportedly handles asynchronous and synchronous speeds up to 76.8K bit/sec. in certain configurations.

The 3272 features standard SMA connectors and diagnostic capabilities to determine synchronization and local and remote loopback functions. Offered as a stand-alone or rack-mounted device, the 3272 also features full-duplex operation.

The 3272 fiber-optic multiplexer is priced from \$2,350 to \$5,950.

Canoga-Perkins, 6630 Independence Ave., Canoga Park, Calif. 91303.

■

International Product Solutions, Inc. has released its ASIX-32 multiplexer.

The ASIX-32 multiplexer is said to require a single chassis slot, providing the user with eight, 16, 24 or 32 individual ports. Even-numbered channels can be either synchronous or asynchronous and can support asynchronous, biynchronous, High-Level Data Link Control and IBM's Synchronous Data Link Control protocols.

The eight-channel port costs \$1,925, the 16-channel port costs \$2,495, the 24-channel port costs \$3,095 and the full 32-channel configuration costs \$3,595.

International Product Solutions, P.O. Box 26755, San Diego, Calif. 92126.

Honeywell, Inc. has introduced the HPM5300 fiber-optic modem, said to improve the data transmission integrity of the IBM 5251 and other compatible cluster-controller systems.

The modem reportedly provides data communications links across distances of 5,000 feet. The HPM5300 can be used in any of eight positions designed for the IBM 5251 protocol, according to the vendor. It consists of an 850-nanometer, high-reliability LED transmitter and a high-reliability detector module.

The HPM5300 is priced at \$1,010.

Honeywell, Honeywell Plaza, Minneapolis, Minn. 55408.

Test equipment

Mod-Tap System has introduced the RS-232 11-Lead and RS-232 8-Lead testers.

The RS-232 11-Lead tester is used to monitor EIA RS-232 interface signals at a 25-pin connector. It allows the user to monitor pins 2, 3, 4, 5, 6, 8, 20, 22, 25 and any other three of the remaining 16 RS-232 connector pins. The tester provides indication for on, off or undefined state for the RS-232 pins and derives power from the channel under test.

The RS-232 8-Lead tester is used to monitor RS-232 interface signals and gain access to any conductor at a modular jack or plug. It derives its power from the channel under test.

The RS-232 11-Lead and the RS-232 8-Lead testers cost \$58 each.

Mod-Tap, P.O. Box 706, Ayer Road, Harvard, Mass. 01451.

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NEW PRODUCTS/COMMUNICATIONS

CAS Electronics has announced the Model 130 portable bus and time-automated grid (TAG) cable tester for users of IBM and Sperry Corp. products.

The Model 120 bus and TAG cable tester for IBM-type cables is said to instantly identify cable faults without removing them from the floor. Conductor-to-conductor, shield-to-conductor shorts and open connections are displayed. According to the vendor, the tester's 25 highly visible LEDs give instant and continuous display of wire status.

The Model 120 cable tester is priced at \$325.

CAS Electronics, P.O. Box 2142, Norwalk, Conn. 06852.

Fotec, Inc. has introduced the Model T310 dual-wavelength test kit, said to be designed for installing and maintaining the IBM 3044 and 8210 fiber-optic systems.

Tests that can be performed using the Model T310 fiber-optic test kit include testing the attenuation of fiber-optic cables and connectors, system transmitter power coupled into the fiber and received power. The kit can also be used to troubleshoot the system, according to the vendor.

The T310 test kit costs from \$2,950, depending on the options.

Fotec, P.O. Box 246, The Schrafft Center, 529 Main St., Boston, Mass. 02129.

SYSTEMS & PERIPHERALS

Processors

Clearpoint, Inc. has introduced the SNXRAM, a 12M-byte Sun Microsystems, Inc. Sun 3-compatible memory card that delivers full 16M-byte address space using a single slot.

SNXRAM is said to require up to three Sun memory cards, freezing two Motorola, Inc. VMEbus slots for expansion. According to the vendor, it comes configured with no DIP switches for correct starting address and memory sizing. It is available in 4M-, 8M- or 16M-byte capacities.

The SNXRAM costs \$7,360 for the 12M-byte version. The 8M-byte and 4M-byte memory cards cost \$5,565 and \$3,760, respectively.

Clearpoint, 99 South St., Hopkinton, Mass. 01748.

General Robotics Corp. has added Python/JR and the Super Python to its product line of supermicrocomputers.

Both Python/JR and Super Python are said to be high-performance, multistage AT&T Ulis engines for Digital Equipment Corp. Q-bus. The Python/JR 32-bit single-board supermicro, said to be for one to eight users, features 2M- to 4M-byte parity random-access memory (RAM) and three asynchronous serial I/O ports. A 2M-byte system costs \$2,995; a 4M-byte system costs \$4,495.

The Super Python is said to support more than 100 users and features more than 2G-byte virtual addressing and 16M to 128M bytes of RAM. The Super Python is priced from \$19,950 for a 16M-byte system to \$89,950 for a 128M-byte system.

General Robotics, 23 S. Main St., Hartford, Wis. 53027.

Graphics systems

IGC Technologies, Inc. has announced the 3DFX family of interactive computer graphics systems for real-time display of three-dimensional imagery.

The 3DFX uses a proprietary multiple digital processor design and is suited to real-time engineering applications requiring interactive solid modeling with shading and hidden-line removal. The 3DFX reportedly provides up to 80 million instructions per second of graphics processing power.

3DFX operates under AT&T Bell Laboratories Unix system.

The 3DFX system costs from \$40,000 to \$60,000.

IGC Technologies, 145 Cityview Drive, Toronto, Ont., Canada M5W 5A5.

Datacopy Corp. has introduced its intelligent imaging subsystem, the General Purpose Imaging Interface (GPII).

The subsystem is said to be designed to process large image files in real time. It includes an image processor that supports user-programmable algorithms for area compensation, contrast corrections, halftone control, and image scaling. The GPII subsystem can interface the Datacopy Series 600 electronic digitizing camera to most computer systems.

The stand-alone GPII costs \$3,995.

Datacopy, 1215 Terra Ave., Mountain View, Calif. 94043.

Data Storage

Applied Data Communications, Inc. has introduced its CD-2500 duplicator for 14-in. streaming tape car-

tridges.

The CD-2500 is said to be capable of producing four, eight, 12 or 16 copies simultaneously in QIC-24 or QIC-11 format. The CD-2500 writes and verifies data from a Winchester disk-based micro to blank cartridges using a bit-map verification.

The CD-2500 costs \$39,995, including an IBM Personal Computer XT-type micro and four drives.

Applied Data Communications, 14272 Chambers Road, Tustin, Calif. 92680.

Digital Equipment Corp. has introduced a 5M-byte memory board.

The 8M-byte memory board is said to enable users to expand the Microvax II computer systems and the

Continued on page 88

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CW

NEW PRODUCTS/SYSTEMS & PERIPHERALS

Continued from page 57

Vaxstations built on the Microvax II to 16M bytes.

The 8M-byte board is said to maintain all the features of previous DEC memory boards, while achieving the double-density capacity through zig-zag in-line package random-access memory chips.

The 8M-byte memory board is priced at \$6,000.

DEC, 146 Main St., Maynard, Mass. 01754.

■

IBM has announced main memory enhancements to end and two controllers for the System/88.

The main memory enhancements expand main memory up to four times for the System/88. Memory is available in 8M-byte increments for users of the System/88 4575 Model 20B processor and in 8M-byte and 16M-byte increments for the 4576 Models 040 and 060 processors.

The controllers allow the System/88 direct-access storage device (DASD) controller to exchange information with System/88 processors with main memory greater than 16M bytes. The System/88 1620 DASD controller is used with the IBM 4580 disk drives.

The 8M-byte and the 16M-byte System/88 memory features cost \$36,500 and \$68,500, respectively. The System/88 1020 and 1030 DASD controllers cost \$6,530 and \$9,180, respectively.

IBM, 1133 Westchester Ave., White Plains, N.Y. 10604.

Printers/Plotters

Kestek Information Systems, Inc. has introduced the K-2 printer.

The K-2 is said to employ LED array imaging with on-board intelligence. Its intelligence is based on an integrated Motorola, Inc. 68000 microprocessor supported by a built-in 64K-byte floppy disk.

Function range from a selection of page sizes, print orientations and fonts to the generation of complex vector graphics, such as statistical symbols and scientific and technical diagrams. The K-2 has two paper cassettes for feeding bond and letterhead paper, transparencies and labels. The K-2 prints 8½" by 11-inch sheets at a rate of 12 page/min.

The K-2 costs \$7,995.

Kestek Information Systems, 6 Pearl Court, Allendale, N.J. 07401.

■

Interface Systems, Inc. has enhanced its ISI 487 IBM 3270-compatible dot matrix printer.

New features include the printing of on-demand bar code output using Code 39. According to the vendor, printing speeds are 200 char./sec. in draft mode and 60 char./sec. for near-letterquality output. Standard features of the ISI 487 are said to include automatic form feed alignment and an extended print buffer for local copy support of the IBM 3278 display terminals Model 3 through 6.

The ISI 487 costs \$3,950.

Interface Systems, 5855 Interface Drive, Ann Arbor, Mich. 48103.

Power Supplies

Instrumentation and Control Systems, Inc. has introduced an uninterruptible power system called Lifeline II.

Said to be designed to provide battery backup for up to 20 minutes in the event of a utility failure, Lifeline II has a built-in power conditioner that delivers filtered, regulated AC sine-wave power at all times.

There is no transfer time and its capacity is 100W, enough to power up to four IBM Personal Computer XT's or a minicomputer. Lifeline II features battery charge status, output power status displays and alarms.

Lifeline II costs \$2,780.

Instrumentation and Control Systems, 520 Interstate Road, Addison, Ill. 60101.

■

Independent Business Systems, Inc. has announced its Linear Power Supply.

The Power Supply is said to provide current voltages of 8V at 25A, 36V at 6A and ±16V at 6A. It also provides selectable regulated +12V at 7A or +24V at 7A. The unit is 110V to 220V switchable for either domestic or international power and includes an integral faraday shield and high-grade circuit board connections.

Linear Power Supply costs \$676.

Independent Business Systems, 5915 Graham Court, Livermore, Calif. 94550.

PRICE REDUCTIONS

Artex Corp. has reduced the price on its enhanced Ada compiler Version 1.10 for IBM Personal Computers and compatibles.

Features include additional support for library subprograms and generics and for formating numbers into character strings and redirected compiler output.

The Ada editor is said to now support multiple windows and multiple files being edited simultaneously with numerous Ada language-specific features.

Ada compiler Version 1.10 has been reduced to \$495 from \$895.

Artex, 100 Seaview Drive, Secaucus, N.J. 07094.

California Software Products, Inc. has reduced the price of its Baby/34.

Baby/34 is said to allow users to replicate a full minicomputer environment on an IBM Personal Computer. Personal Computer XT, AT or compatible.

According to the vendor, Baby/34 comes with an RPG II compiler, screen format generator, sort entry utility, workstation I/O and data exchange utility.

The Baby/34 is now priced at \$1,250.

The Baby/34 with the Data File Utility now costs \$1,500.

California Software Products, 525 N. Cabrilto Park Drive, Santa Ana, Calif. 92701.

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COMPUTER INDUSTRY

Section begins on page 114

Texet finds publishing sales pitch must focus on bottom line

CEO aims marketing at decision makers

By Eddy Goldberg

ARLINGTON, Mass. — Survivors in the high-end electronic publishing system market have learned a hard though simple lesson: Find corporate decision makers, sell them on the economic and time savings benefits of electronic publishing and explain the bells and whistles later.

One of the survivors is Texet Corp., a 6½-year-old start-up that reached \$12 million in revenue in fiscal 1986. The company has made a clear shift in its selling approach since the arrival of marketing-minded President and Chief Executive Officer Al Irerton late last year.

"The failure we've all had is trying to sell electronic publishing systems to corporations as we did to commercial type shops," says Texet cofounder and Chairman Daniel Kennedy. "The reality is that we have to sell it as a solution to some kind of time problem and recognize that the need we're trying to solve is a business need."

Kennedy had previously cofounded Quadex Corp., a vendor of text processing systems that merged with Compugraphic Corp. in 1979. He co-founded Texet in April 1982, and the

firm began production deliveries of its electronic publishing systems in the third quarter of 1984.

But as recently as late 1985, industry observers were wondering whether the start-up would survive. Then Kennedy brought in Irerton, who had 25 years of experience in sales, marketing and general business. Irerton took charge of day-to-day management, leaving Kennedy free to focus on product development and strategic planning.

Texet's new approach appears to be succeeding. A fourth round of \$7.2 million in venture capital financing last April brought Texet's total capitalization to more than \$17 million. Kennedy and friends expect revenues to double to about \$24 million when fiscal 1986 ends next June.

For the technical document department manager, the benefits of electronic publishing are clear. However, the competitive importance of this capability may not be so apparent to decision makers. Texet tailors its sales pitch to senior management on the capital expenditure committee, such as vice-presidents of marketing and sales.

"We need to find out the importance of decision makers in the organization and who approves it," Irerton says. "We work to explain and define what computer-aided publishing is and how it's different from desktop publishing. It's a new industry and there is confusion."

Texet's product line, the Live Image Publishing System, is a high-end turnkey system designed for the corporate technical publishing market. The system includes semiautomatic, high-resolution workstations with proprietary software, graphic scanners, disk and tape storage devices, a laser printer, interfaces to phototypesetters and a local-area network.

Texet's primary target industry is including computer hardware and software firms, electronics and manufacturing companies and aerospace firms, which publish government bid proposals that frequently need last-minute revisions.

Texet defines three market segments. The low-end and largest segment, which Texet estimates at about \$10 billion annually, includes word processing and desktop publishing done on personal computers, usually

for a maximum of \$10,000 per system. The mid-range segment, which Texet calls "green publishing," includes systems that run from about \$10,000 to \$50,000 and is estimated to be a \$100 million annual market.

Texet places itself in the professional publishing market, where published documents have a direct impact on a company's bottom line. System costs run from about \$60,000 to \$1 million, and document sizes range from 50 to 10,000 pages. Other players in this estimated \$1.5 billion annual market include Xyvision, Inc. and Cimex, Inc. Text and graphics are originated on other systems, such as word processors, micros and scanners, and then composed and paginated to produce a camera-ready document.

One way to convince decision makers is in a time of capital spending cutbacks is through a leasing plan, in which the cost of the system is spread over a long period of time, thus moving it off the capital expenditure balance sheet, Irerton says. He says he thinks that a short-term, low-risk commitment with a relatively short payback period will move corporate decision makers off the fence.

"The problem is that potential customers aren't clear on the payback corporate electronic publishing offers them, so we provide the service," Irerton says.

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Australian Macworld is Australia's magazine for the Macintosh user community. It is published bi-monthly and has a circulation of 12,000.

Communications World is CW's newest publication.

tion reaching the Australian market. This bi-monthly publication covers telecommunications, office communications and network management, and has a circulation of 10,000.

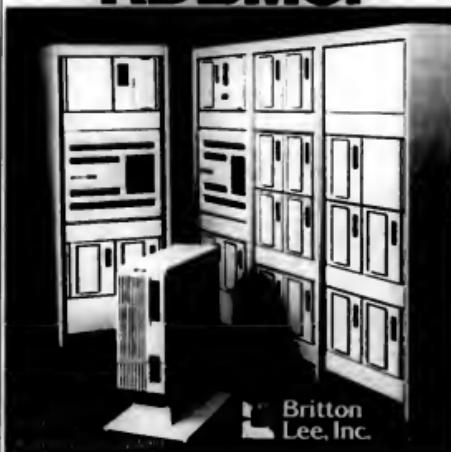
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COMPUTER INDUSTRY

San Francisco firm teams up with Japanese for CIM projects

Consortium plans use of GM's MAP

By Takeshita Kondo
CW Communications International
New York

TOKYO — Bechtel Corp., a San Francisco-based engineering company, has formed a consortium with three Japanese firms to enter the burgeoning computer-integrated manufacturing (CIM) market.

The three Japanese firms slated to team up with Bechtel are: Toyo Engineering Corp., Sumitomo Electric Industries Ltd. and Toyota Machine Works Ltd. The four

are tools for computerized production.

It is thought that the upcoming joint venture involving the U.S. company will prove a stepping-stone to popularizing MAP throughout Japan. "Because of Bechtel's ties with IBM, many future customers of the consortium will turn to this protocol," a Toyota Machine

official said.

Bechtel, one of the world's largest engineering firms, is said to be pursuing an aggressive diversification plan, moving into factory automation and microchips. Last fall, the company entered a partnership with IBM in CIM, and in July, it spun off a separate division for leading-edge technology businesses.

Sumitomo Electric and Toyota Machine are two of Japan's foremost firms involved in computerized and networked manufacturing systems. Respectively, they lead the Japanese markets in optical fiber-based LAN systems and flexible manufacturing systems.

Toyota Machine, a Toyota Motor Corp. affiliate, also is

one of six Japanese firms that have announced full support for MAP. Toyota Machine recently began building a MAP-based system at its Tokyo factory.

While the consortium's primary target will be the U.S. and Japan, insiders speculate that its scope will broaden to include Southeast Asian and European firms.

'Because of Bechtel's ties with IBM, many future customers of the consortium will turn to this protocol.'

— Toyota Machine Works Ltd. official

firms will coordinate efforts to win orders from U.S. and Japanese producers of autos, electronics, machinery and pharmaceutical products.

According to a Sumitomo Electric official, the deal will also stipulate that the partner firms exchange information on other leading industrial manufacturers with plans to use General Motors Corp.'s Manufacturing Automation Protocol (MAP) and local-area networks (LANs).

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more productive because they can concentrate on what they want to process, rather than on how to get the data. For example, one line of SQL can do the work of many lines of COBOL.

And programmers can also be more efficient because of all the supporting software IBM has developed: high level programming languages, program generators and extensive programming tools and aids.

A User's Dream

What's more, SQL is based on English, which means that users can easily access information in DB2 files, either directly or by means of products like Query Management

COMPUTER INDUSTRY

Floating Point Systems reports \$2.9M third-quarter loss

Plans layoffs, hiring freeze

By Ninian Brooks Maglana

BEAVERTON, Ore. — Floating Point Systems, Inc. last week announced a third-quarter loss of \$2.9 million, or 23 cents per share, as well as plans to cut 12% of its

work force, or about 200 employees.

Floating Point reported revenue of \$20.1 million for the third quarter ended July 31, a 38% drop from the same quarter last year. The supplier of arrays of parallel supercomputers and supercomputers reported in last year's third quarter a profit of \$3.6 million, or 43 cents

per share.

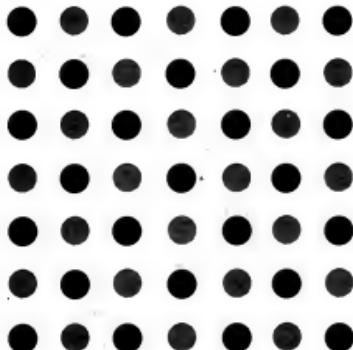
Besides the proposed layoffs, the firm plans a hiring freeze, a deferral of salary increases and general expense cuts in the coming year.

John R. Turner, Floating Point's president and chief executive officer, partially blamed the sharp revenue decline on intensified competition in the minicomputer market. Turner said funding delays on several large potential domestic orders and difficulty in closing some international contracts also injured third-quarter results.

"Because we underestimated the negative effects of a worsening capital spending environment and increased competition, especially in the minicomputer market, Turner said funding delays on several large potential domestic orders and difficulty in closing some international contracts also injured third-quarter results.

ter operating expenses were targeted for considerably greater revenue," he said.

Floating Point is not predicting an immediate recovery in previous revenue or net income levels, according to Turner. "Neither the economy nor the competitive environment are expected to improve measurably in the fourth quarter," he said.



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The next step is up to you. We can recommend any one of three smart ways to get more information on DB2. Contact your IBM marketing representative. Call 1 800 IBM-2468, Ext. CC/90, for literature. Or use the coupon below.



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Wang exec to be named Intecom CEO

By Stanley Gibson

ATLLEN, Texas — Intecom, Inc., a maker of high-end private branch exchanges, confirmed last week that Wang Laboratories, Inc. Vice-President John Thibault will be named chief executive officer.

Thibault, Wang's vice-president of corporate quality, will assume his new duties at the completion of Intecom's acquisition by Wang, according to an Intecom representative. Stockholders will vote on the merger at a meeting Sept. 3.

Earlier, Intecom confirmed information from Wang sources [CW, June 9] that Thibault would be named to head the firm. A Wang representative, however, refused to confirm the appointment, saying only that Thibault would continue to be part of a team of senior-level Wang and Intecom managers in charge of the firm.

Thomas, 33, has been part of a transition team managing the acquisition of Intecom.

The Intecom representative said Erik Ringjob would remain in his position as president and chief operating officer, and Intecom founder and current Chairman C. Michael Bowen would become a consultant to Wang.

Separately, the representative said that Hal Denton, director of product management, is serving as acting vice-president of product marketing in place of Lee Thomas, who died recently.

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**INSIDERS AND
ACQUISITIONS**

Convergent Technologies, Inc., of San Jose, Calif., announced completion of its acquisition of the privately held **Display Data Corp.** of Hunt Valley, Md. Shareholders of Display Data now control 7.6 million shares of Convergent common stock and represent approximately 16.5% of the outstanding Convergent stock after the merger. Display Data, a leading vendor of computerized management systems, will become a key part of the Convergent Small Business Services subsidiary. ■

CMI Corp., formerly a wholly

owned subsidiary of **Torchmark Corp.**, announced the completion of an agreement to acquire 30% of the privately held firm from its parent company.

Forty percent of CMI has been retained by Torchmark, and 39% has been acquired by **Stephens, Inc.**, an investment banking firm based in Little Rock, Ark. Under this agreement, CMI Corp. becomes **CMI Holding Co.**, a new corporation consisting of the shares owned by CMI, Torchmark and Stephens.

The Flagship Group, Inc., a microcomputer software holding company, announced that it has acquired **MC Software, Inc.**, of Davis, Calif., for an undisclosed sum of cash and stock.

The Flagship Group is assembling a team of software companies with industry-specific products and is pro-

viding those firms with the resources required to capture a larger share of their respective markets. MC Software is the first of 10 to 20 acquisitions The Flagship Group is expected to make over the next two years. ■

Modular Computer Systems, Inc. (Modcomp) has become a wholly-owned subsidiary of **ABG Aktiengesellschaft**. Modcomp is now an AEG company. AEG is a large, broad-based West German electrical and electronics company. It is a member of the Daimler-Benz group, with annual sales of more than \$20 billion. ■

American Management Systems, Inc. (AMS) has acquired the **Bankerv** product line of **Anacomp, Inc.**, including license and service agreements with 123 financial institutions and ownership of six credit manage-

ment software products for banks. AMS will pay an undisclosed amount of cash and royalties on the products. ■

ICOT Corp. announced that it has signed a definitive agreement to acquire **Integrated Network Systems Inc.** (INS) of Mobile, Ala., for one million shares of ICOT common stock. INS manufactures communication products that allow personal computers to communicate, access and transfer data through the IBM Systems Network Architecture and International CCIIT X.25 networks. ■

Emerald Technology Group, Inc., of Bellevue, Wash., announced that it has merged with **Software Systems, Inc.** (SSI) of Jefferson City, Mo. No financial details of the merger were disclosed. Founded in 1984, Emerald Technology markets data communications products for the IBM System/34, 36 and 38 market. SSI was founded in 1980 by Joe Frank, an architect of IBM's System/34 SSP operating system. SSI is a vendor of System/34, 36 and 38 communications products.

Continued on page 94

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Who sets the standards?

From page 114

nowhere near what it would have been four years ago, before the standard was established," Compaq Chief Financial Officer John Gribit said recently. "The industry doesn't have to wait on IBM anymore."

Who sets the standard now? Intel? Microsoft? Ashton-Tate and Lotus Development Corp., with industry-standard software applications?

The answer is none of them—and all of them. Whether they make chips, spreadsheets or CPUs, all vendors will follow the fastest path to profits. They will go where the market is, and the market wants machines that solve problems and talk to each other. IBM and all of the above vendors have had a hand in shaping the standard to which the users have given their stamp of approval.

But as Gribit points out, the market has evolved too far for any one vendor, including a \$60 billion behemoth, to completely dictate. Security analysts and shareholders love to grill Compaq about the possibility of IBM slamming the door on open architecture, but the Houston-based microcomputer wunderkind says it isn't worried.

"They can put proprietary features in read-only memory," Gribit said, "but they have to be useful. Will a software company write only for IBM when there are so many other users? Can IBM force them to? The standards issue is more subtle than just what is proprietary."

No one should be naive enough to think that IBM, at some point, will not become the leading vendor of 80386-based machines. But in order to do that, it must follow the installed base of users and the software leaders. And in order to accomplish that, it must make sure that it follows the de facto industry standard for the 80386 market, a standard that no longer bears the name IBM.

Digital NEWS

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1. What is the primary business activity of your firm at this location? (PLEASE CIRCLE ONE CODE ONLY)

- A. Manufacturer of Computer Equipment (Data Processing, Communications, etc.)
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- C. Manufacturing of Electronic Products, Goods, Agriculture, Mining, Oil, Natural Resources
- D. Transportation, Utilities, Communications
- E. Public Utilities (Electric, Gas, Telephone)
- F. Manufacturing, Assembly, Distribution
- G. Financial, Banking, Insurance, Real Estate Services
- H. Manufacturing, Assembly, Distribution
- I. Legal/Firms, Services
- J. Educational Institutions, Colleges, University
- K. Governmental Local, State, Federal, Military
- L. Computer Consulting, Training
- M. Research, Development
- N. Engineering, Architecture, Construction
- O. Manufacturing, Assembly, & Development
- P. Other Business Services
- 2. Other

2. What is your primary job function? (PLEASE CIRCLE ONE CODE ONLY)

- A. COMPUTER SYSTEMS MANAGEMENT TITLES INCLUDE: President, VP, President/Controller, Director, General Manager, Business Manager, Department Manager, Project Manager, Manager, Supervisor, Personnel, and Management Administrators.
- B. COMPUTER SYSTEMS MANAGEMENT TITLES INCLUDE: V.P./CFO, M/S Director, Data Processing, Manager, Data Communications Manager, Manager, Project Manager, Manager, Supervisor, and Management Administrators.

C. ENGINEERING/TECHNICAL MANAGEMENT TITLES INCLUDE: V.P./Engineering, V.P./R&D, Chief Engineer, Technical Director, Director of R&D, Project Manager, Manager, Supervisor, and Management Administrators.

D. BUSINESS/OPERATIONS MANAGEMENT/PRODUCTION MANAGEMENT TITLES INCLUDE: V.P./Operations, Manager, Production, Manager, Operations/Manager, Production, Production Manager, Manager, Supervisor, and Management Administrators.

E. MARKETING/MANAGEMENT TITLES INCLUDE: V.P./Marketing, Manager, Marketing, Marketing Manager, Marketing Manager, Product Manager, Sales Director, Sales Manager, Director of Marketing, Sales Manager, Manager, Supervisor, and Management Administrators.

F. ADMINISTRATIVE STAFF TITLES INCLUDE: Admin. Assistant, Admin. Manager, Admin. Coordinator, Executive Admin.

G. COMPUTER SYSTEMS STAFF TITLES INCLUDE: Computer Systems Analyst, Computer Systems Analyst, Systems Testers, Data Analyst, Systems Analyst, Specialized Testers, Computer Systems Analysts, Specialized Testers, Data Analysts. Data Communications Personnel, EDIF/ML, Data Communications.

H. ENGINEERING/TECHNICAL STAFF TITLES INCLUDE: Computer Systems Engineer, Computer Systems Engineer, Applications Engineer, Technical Staff Member, Technical Support, Technical Support Staff.

I. MARKETING STAFF TITLES INCLUDE: Marketing Analyst, Sales Analyst, Sales Representative, Sales Representative, Sales Representative, Marketing Research, Sales Representative.

J. EDUCATION/TRAINING TITLES INCLUDE: Computer Systems Trainer, Computer Systems Trainer, Computer Systems Trainer.

K. CONSULTING TITLES INCLUDE: Consultant, Advisor, DEPARTMENTS INCLUDE: Consulting, EDIF/ML, Computer Systems.

L. OTHER

3a. Are any of your VAXes part of a VAXCLUSTER? Yes No

3b. Are any of your VAXes part of a DECnet network? Yes No

3c. If your VAX systems are active nodes on one or more networks, is the network? (CIRCLE ALL THAT APPLY)

- A. Local
- B. Company-wide
- C. None of the Above

3d. Do you have any VAX computers located elsewhere? Yes No

4a. Do you have any VAX computers installed at your location? Yes No

4b. Do you plan to buy VAX computers for your location within the next twelve months? Yes No

4c. If you answered "yes" to question 4a, what types of VAX computers do you currently own and what types of VAX computers do you plan to purchase? (PLEASE RESPOND WITH SPECIFIC QUANTITIES)

ITEM	QTY CURRENTLY OWNED	QTY PLANNED FOR PURCHASE IN NEXT 12 MONTHS
A. VAX 8800		
B. VAX 7800		
C. VAX 6800		
D. VAX 5800		
E. VAX 4800		
F. VAX 3800		
G. VAX 2800		
H. VAX 1800		
I. VAX 1100		
J. VAX 1100		
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EXECUTIVE REPORTS

Special Editorial Features

Every issue of Computerworld presents either a Product Spotlight or Executive Report. For advertisers, it's still not too late to take advantage of the hot topics.

Communication Standards (Executive Report, September 22) Focuses on electronic data exchange protocol (EDI), which allows for the direct computer to computer exchange of standard business forms. This report studies the value of EDI in the transmission of purchase orders, invoices and other important documents in various industries. Also, a look at how EDI is strengthening the trade relationships between customers and suppliers. Closing date September 5.

On-line Computing (Executive Report, September 29) Explores the fact that although on-line transaction processing (OLTP) has been around since the 1960s, the market is now heating up with IBM and some BUNCH companies battling a group of young companies for the bulk of the market. This report examines on-line computing with a look at the major players, the current state of the art, and what users want. Closing date September 12.

Hardware Roundup (Product Spotlight, October 6) Covers large and medium-scale computer systems. Specifically looks at the past year's product innovations, significant revisions and enhancements, and what major players in the mainframe and supermini categories have been doing. A sidebar looks at what's going on with the BUNCH companies. Closing date September 19.

Hardware Roundup (Product Spotlight, October 13) Takes an in-depth look at small-scale systems — supermicros and minicomputers. Examines market figures, product announcements and changes over the last year. A chart provides a look at about 50 small-scale systems. Closing date September 26.

And it doesn't stop there! Important and pertinent Executive Reports and Product Spotlights topics continue through October and November.

ISSUE	TOPIC	CLOSING DATE
October 20	Hardware Roundup/Microcomputers (Product Spotlight)	October 3
October 27	Decision Support Systems (Executive Report)	October 10
November 3	*1000th Issue/40th Anniversary of the Computer*	October 10
November 10	PC Graphics Hardware (Product Spotlight)	October 24
November 12	*Computerworld Focus on Microcomputing*	October 3
November 17	Systems Integrators (Executive Report)	October 31
November 24	Vertical Markets (Executive Report)	November 7

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PRODUCT SPOTLIGHTS

COMPUTER INDUSTRY

Bell Atlantic names software chief, raises acquisition issue

PHILADELPHIA — Bell Atlantic Corp. last week appointed Gerard J. Caccappolo to the newly created position of vice-president of software and systems development, raising the possibility that Bell Atlantic may be planning to acquire a software firm.

"He was active in shaping Bell Atlantic's early direc-

tion outside the phone business," a Bell Atlantic spokesman said.

"The creation of the enterprises organization and the acquisition of Sorbus, Inc. are good examples," he added.

Although the spokesman declined to elaborate on specific acquisition targets, he was unequivocal in stating

the holding company's overall strategy.

"We have identified some opportunities for possible transactions," he claimed. "Software is a high-growth area of the industry, and we have the skills and vision to pursue it. The first step is to concentrate on the software industry outside the phone business."

tions, Inc.

Caccappolo, 44, will assume the new vice-president position Sept. 15.

He came to Bell Atlantic as executive director of planning and corporate development in 1983. Caccappolo later became vice-president of planning and corporate development.

— Stanley Gibson

Continued from page 82

Protocol Computers, Inc. has concluded its merger with a wholly owned subsidiary of **Telematics International, Inc.**

Under the terms of the merger, each share of Protocol common stock, other than shares (52.4%) held by Richard L. Swartz, Protocol's founder and majority shareholder, will be converted into the right to receive \$1.40 in cash.

Wang Laboratories, Inc. recently acquired a minority stake in **Custom Software Services, Inc. (CSS)**, a Bellevue, Wash., software company targeting primarily the legal industry.

The terms of the acquisition contract allow Wang to increase its share of the common stock to 21% of the outstanding shares by 1989. Privately held CSS will continue to operate as an independent entity.

Sungard Data Systems, Inc. and **HSH National Management, Inc.** have reached an agreement in principle for Sungard to acquire HSH. The planned transaction is scheduled to be completed by Oct. 1.

HSH is a consulting firm providing planning and educational services in the areas of computer center disaster recovery, security and emergency preparedness.

The privately owned company is based in Columbus, Ohio.

Computer Task Group, Inc. announced its first international acquisition. **Shubrooks International, Ltd.** Shubrooks is a software consultant firm with headquarters in Chertsey, England, and offices in Newbury and London, England, and Kansas City, Mo.

Cincinnati Milacron, Inc. announced the signing of a purchase agreement with **International Laser Machines Corp. (ILM)** of Indianapolis whereby ILM becomes a wholly owned subsidiary of Cincinnati Milacron. Terms of the purchase were not disclosed.

ILM is a U.S. manufacturer of advanced laser machines and systems for industrial applications.

Other regional holding companies have acquired software firms, but Bell Atlantic has yet to do so.

Recent acquisitions

In November 1985, **America-tech** acquired **Applied Data Research, Inc.**, and during this summer, **U.S. West** acquired banking software firm **Applied Communications**.



COMPUTER INDUSTRY

Lefebvre signs on with expert systems developer Cognitive

Former Multimate exec relocates

NEW HAVEN, Conn. — Even since playing a key role in the 1985 sale of Multimate to Ashton-Tate, the second president and chief executive officer of Cognitive Systems, Inc., replacing David Fox, who will continue to serve as chairman of Cognitive's executive committee.

Based in New Haven, Cognitive develops natural lan-

guage-based expert systems for the financial industry. Last year, the company reported revenue of approximately \$4 million. Cognitive, which was public in May, employs 45 people.

According to Lefebvre, Cognitive is using an inferential reasoning technique to develop generic expert system products for targeted in-

dustries. "We're putting our bets on a world that is natural language-oriented and doing computer-AI systems," Lefebvre said.

Lefebvre noted that a whopping 80% of the company's revenue is devoted to research and development and that the company expects to continue in a development mode for another one to two

years. "We're a development company, not yet a commercial company," he said.

For the second-quarter ended May 31, Cognitive reported sales of \$185,000 and a net loss of 1 cent per share, compared with sales of \$226,000 and a loss of 16 cents per share a year earlier.

— Maury McNamee

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Tandon splits into two units

From page 114

vertically integrating within the disk drive unit, they will be able to save money," he said.

Last week's reorganization also shifted control of day-to-day operations from founder Sirlang "Jugi" Tandon to former IBM executive and current Tandon President Dan Wilkie.

Under the reorganization plan, Wilkie will head up a new committee overseeing the two business units. He will also be in charge of the microcomputer business unit, with fellow IBM vet. an H. L. "Sparky" Sparks in charge of sales and marketing for the unit. Sparks was responsible for Tandon's entry into the personal computer dealer channel in July.

Another former IBM employee, Joseph A. Sarubbi, will head the disk drive and subsystem unit, with Jeff Segers retaining his responsibility for sales and marketing of those products. Sarubbi, former technology and systems architecture director of IBM's Entry Systems Division, joined Tandon last February.

Shearson's Stone was not sure how Tandon's executive changes fit in with its recent personal computer strategy. "Jugi is a bit of a street fighter, and PC compatibles is not a polite market," Stone noted.

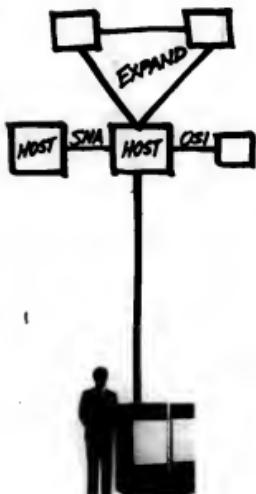
Analysts say Tandon also has other problems to contend with, particularly in production schedules. A Tandon version of the PC AT will not ship until after its Christmas 1986 target date, analysts say.

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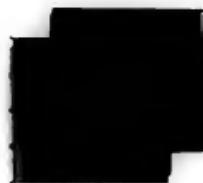
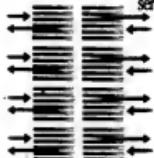
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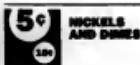
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TANDEM COMPUTERS

COMPUTER INDUSTRY



Automatic Data Processing, Inc. reported revenue for the fourth quarter ended June 30 of \$418.6 million, compared with \$266.7 million in the like quarter last year. Profits were \$30.9 million, or 42 cents per share, compared with \$26 million, or 36 cents per share, a year ago.

For the year, revenue was \$1.2 billion, compared with \$1 billion in the previous year. Profits were \$105 million, or \$1.45 per share, compared with \$87.6 million, or \$1.22 per share, one year ago.

Computer Memories, Inc. reported revenue for the first quarter ended June 30 of \$4.2 million, compared with \$50.6 million last year. Profits were \$11,000, compared with \$4.8 million in the like period a year ago.

Ultimate Corp. announced revenue for the first quarter ended July 31 of \$36.7 million, a 39% increase from revenue of \$26.4 million for the same period a year earlier. Profits were \$2.3 million, or 25 cents per share, compared with \$2.6 million, or 30 cents per share, in the comparable period last year.

Bolt Beranek and Newman, Inc. reported net income for the fourth quarter ended June 30 of \$5.4 million, or 59 cents per share, compared with \$2.4 million, or 29 cents per share, in the like period a year ago. Revenue for the quarter was \$49.3 million, compared with \$41.6 million in the previous year.

Corvus Systems, Inc. announced revenue for the year ended May 31 of

\$42.1 million, compared with \$53.3 million in the previous year. Net loss for the year was \$32.6 million, or \$1.17 per share, a 61% increase from a \$20.4 million, or 79 cents per share, loss in the previous year.

For the fourth quarter, revenue was \$11.4 million, compared with \$12 million in the like period last year. Net loss was \$3 million, or 11 cents per share, compared with a net loss of \$14.8 million, or 57 cents per share, for the comparable period last year.

Tandy Corp. reported revenue for the year ended June 30 of \$3 billion, compared with \$2.6 billion in the previous year. Profits were \$197.7 million, or \$2.22 per share, compared with \$180.1 million, or \$2.11 per share, a year ago.

For the fourth quarter, revenue

was \$690.6 million, compared with \$603.8 million in the same quarter last year. Profits were \$26.8 million, or \$0.30 cents per share, compared with \$53.2 million, or 60 cents per share, in the like period a year ago.

Emulex Corp. announced revenue for the fourth quarter ended June 29 of \$27.9 million, compared with \$20.8 million in the like quarter last year. Profits were \$2.3 million, or 11 cents per share, up 112% from \$1.1 million, or 8 cents per share, reported in the same quarter a year earlier.

Massachusetts Computer Corp. reported revenue for the year ended June 30 of \$50.9 million, compared with \$44.2 million in the previous year. Net loss for the year was \$1.5 million, or 11 cents per share, compared with a net profit of \$980,000,

or 7 cents per share, last year.

For the fourth quarter, revenue was \$15.5 million, compared with \$11 million in the like quarter last year. Net profit was \$760,000, or 6 cents per share, compared with a net loss of \$1.2 million, or 8 cents per share, in the previous year.

Computer & Communications Technology Corp. announced a net loss of \$7.6 million, or 99 cents per share, on revenue of \$17.4 million for the second quarter ended June 28. This compares with a net income of \$177,000, or 2 cents per share, on revenue of \$25.4 million for the comparable period a year ago.

Silicon Graphics, Inc. reported revenue for the year ended June 30 of \$41.5 million, compared with \$21.5 million in the previous year.

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Retailer breathes life into products

From page 114

machines as ready-to-run systems. Godfather's, whose major business is selling close-out equipment, plans to enter manufacturing with Columbia's PC AT-compatible, which was designed just before the company folded, Welsh reports.

Godfather's will use the acquired Columbia printed circuit boards for the computers and will farm out any future manufacturing, if required, according to a Godfather's manager.

Victim of poor management

Many industry observers say they feel that Columbia is a classic case of a well-regarded micro product that fell victim to poor management and the saturated IBM-compatible micro market.

Whether a small Florida retailer can revive that product line remains to be seen, but user confidence in Columbia's technology appears to be one point in Godfather's favor.

"In the military, there's a weapon called the '46 automatic,'" the U.S. Navy's New says. "It takes beatings, grudges, mud, slush, and it always works for us. This Columbia machine is like that for us. It's a very fine machine."

"When trying to reach VAX users, Computerworld gets results."

E. Stephen Lilly
Director of Marketing
Computer Information Systems
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Steve Lilly, Director of Marketing for Computer Information Systems (CIS), had set a clear enough goal: he wanted to introduce CIS' system management software, Quantum RS, to the marketplace and explain how it is used for VAX resource tracking, capacity planning and resource/cost allocation. Steve delivered his message in Computerworld as well as in other trade publications. He quickly discovered that Computerworld does, indeed, get results. "Computerworld has helped CIS reach its target audience — the decision-making systems managers who are current and future users of VAX systems," he says. "Basically, Computerworld readers are serious buyers; if they inquire about a product, they're a viable lead — and often a sale."

Steve is sure about this because CIS tracks its leads with an in-house marketing system.

"We've found that Quantum RS generates a tremendous amount of interest, but CIS' sales department is dependent on the quality — not quantity — of responses. And we know Computerworld delivers quality — which added to Quantum RS' sales increase of 218 percent last year," Steve says.

One reason CIS has relied on Computerworld over the last two years is Computerworld's diverse coverage. "Computerworld covers the industry. Today's corporate DP shop is more of a mixed-vendor environment than it was in the past. In growing numbers, corporate users are utilizing IBM PCs and ATs for microcomputing and

DEC VAX systems for departmental and mainframe computing," notes Steve. "Based on this, we've found Computerworld to be a very effective vehicle to reach VAX users, especially in large DP environments."

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NEWS

Site license: Micro managers respond

From page 1

respondents considered price to be very important, and 25% considered price to be somewhat important. From firms with sales-per-site of more than \$100 million, 90% believed vendors should provide site licensing, and 83% of the respondents cited price as very important.

Site licensing is on the upswing. A recent Forrester Research, Inc. poll of 42 Fortune 1,000 companies concludes that 22% were site-licensing (providing a license for a site) at least one package, and 17% were company-licensing (providing a license that covers an entire corporation) at least one package. Forrester expects both types of licensing to increase 50% in the next year.

Buckholz is not alone in pushing for site licenses. "A lot of firms believe that if they don't give us a site license, we will buy the product anyway. That is just not true," says Walter Kennamer, manager of the software and systems audit group of Big Eight accounting firm Ernst & Whitney in Cleveland. "Before I would standardize on anything, I would have to have an unlimited site license. Nobody out there is that good that they don't have competition that is good enough."

Like Buckholz, Kennamer does not feel that avoiding the major vendors means settling for second best. "I have no trouble at all defending the proposition that [Computer Associates'] Supercalc is a better product than Lotus 1-2-3. But even if Lotus had been better than Supercalc, we wouldn't have standardized on Lotus, because they weren't willing to do business with us on terms we could accept."

The advantages of site licensing to users go far beyond price and include product standardization, wider distribution of technology, limited liability for unauthorized copying, and better support and a closer relationship with the software vendor.

The marginal cost of an additional software package under a site license is almost zero. It costs nothing for a new user to learn the product. The site license goes a long way in encouraging people to use microcomputers. As a result, we are going to have a lot more copies than we would have if we bought them on an individual basis," Kennamer says.

Users' fears of messy lawsuits over piracy are allayed by site-license agreements. "We were very concerned with making sure that the copyright on software we buy is protected. We are ethical, and we don't want to get sued," Kennamer says.

Site license also helps firms distribute more technology to end users. "In our company, hardware and software are budgeted separately. Had we not had the licensing, we would not have had any more money on software, and we would have run out of resources to buy hardware," Buckholz says.

Biggest deal yet

In the most publicized site-license announcement to date, General Electric Co. reached unlimited licensing agreements with Office Solutions, Inc. and Computer Associates. "Our preferred method of doing business is to go with the unlimited license," notes Pat Stadel, manager of application software acquisition for GE Corporate Information Technology in Bridgeport, Conn.

According to GE, the program is a success. "Before the announcement was even issued, there were over 1,000 orders for Supercalc," says Fred Dunay, a GE representative. GE has already shipped 5,000 of the

various packages covered by site licenses, and most of those orders are for Office Writer, Dunay says. He notes there are 25,000 personal computers with site licenses.

Lotus has taken pains to point out that GE remains an excellent customer, and observers have wondered if Supercalc will become the GE corporate standard.

"We never intended to displace Lotus. We intended Supercalc to co-exist with Lotus," Stadel says.

Although the absence of site licensing or aggressive volume purchase clauses from the top three microcomputer software vendors has given smaller vendors a chance to make inroads into the corporate market, it takes more than low prices to make some corporations adopt packages from smaller vendors.

"The products we most want site licenses for are from the bigger vendors," says Ronald Jenks, director of information services for Touché Ross & Co.

"We are not really interested in switching to a smaller vendor who offers a site license with a lower price," says Bay Baron, manager of advanced office systems for Michelin Consolidated Gsa Co.

But some believe that smaller vendors are pricing products too aggressively and sacrificing profits in a desperate attempt to gain market share.

"Chances are, the smaller companies are at best breaking even in their site-license programs. Some companies are offering site licenses out of desperation," claims Robert M. Lefkowitz, vice-president of software research for Infocomp Corp.

"I think there are some smaller vendors who might be using this as a last stab at a presence," agrees Jan Eddy, president of Office Solutions, which does offer site licensing.

But Buckholz does not buy the desperation theory and reports that none of the vendors with which he

has a license have gone out of business. Citing company policy of not discussing specific vendors, Buckholz declined to say what products are licensed.

Smaller firms argue that aggressive pricing not only gets a firm's foot in the corporate door, but provides profitability.

"When Ed Eddy [chairman of Ashton-Tate] says site licensing is economic suicide, he is right. It is for them. For us, though, it makes a lot of sense because we will get revenue we wouldn't otherwise get," says Eliot Sokolow, director of sales for Cosmos, Inc.

In addition to profits, the benefits of site-license programs for smaller vendors include increased visibility; the possibility of becoming a standard within a large corporation; additional revenue from upgrades, new products and support; and keeping competitors out of these accounts.

"It is strictly an economic decision for software vendors. Site licenses make it easier if they can up pull more money out of the market than selling on a per-copy basis," says Jeffrey Tarter, publisher of "Software Letter," an industry newsletter published in Cambridge, Mass.

"When you look at the fact that we are taking sales away from another product, it is perhaps easier that we would not have made at all without the site licensing," Office Solution's Eddy says.

The question remains: Will the top three firms ever bow to the pressure for site licensing? Tarter doubts that any of the top three microcomputer software firms will offer site licensing in the near future. "Lotus and Ashton-Tate are so close to saturating the market for their products that they may have something to lose by site-licensing."

For GE's Stadel, it is still an open question. "We have ongoing negotiations with each of them," she says.

Leading options: Site licensing, discounts, support

Site Licensing, volume discounts or support programs available from selected microcomputer software vendors

Lattice Development Corp.

Major products:

Lotus 1-2-3, Symphony

Copy protection and liability:

Copy protection enforced for those sites 100 or more copies of the latest versions of 1-2-3 or Symphony. Limited liability plates for the retail price of illegally copied software is available for firms with an annual company program. Contact signed by company owner required.

Pricing and licensing: \$200 license of 1-2-3 or Symphony are available; price is determined through quoted bids. Site license will not be lower than three discounts from high-volume dealers.

Upgrades:

Upgrades are distributed direct. Volumes 1 to 100, \$100 per copy; 100 to 999, \$125 per copy; and above 1,000, \$100 per copy.

Microsoft Corp.

Major products:

Multiplan, Microsoft Word

Copy protection and liability:

User is liable only for the full retail price of

illegally copied software. Most products are no longer copy protected.

Pricing and volume requirements: A minimum of \$100,000 is needed to qualify for a 40% discount.

Upgrades:

Upgrades are distributed either via a master disk or by Microsoft. Participating firms receive upgrades for half price.

Ashton-Tate

Major products:

Lotus 1-2-3, PerfectOffice

Copy protection and liability:

Copy protection is no longer available, and there is no limited liability for illegal copying.

Pricing and volume requirements: No direct sales or discounts are available from Ashton-Tate. Purchase price is still negotiated between the corporation and a computer dealer.

Upgrades:

All upgrades can be covered by an annual fee, or upgrades can be made on a one-time basis.

Computer Associates

International, Inc.'s Micro

Products Division

Major products:

Supercalc 4

Copy protection and liability: No copy protection, no limited liability.

Pricing and volume requirements: An unlimited site license starts at \$462,000.

Upgrades:

Available via site to firms with maintenance agreements.

WordPerfect Corp.

Major products:

WordPerfect

Copy protection and liability:

No copy protection, limited liability available.

Pricing and volume requirements: Site licenses for Word Perfect range from \$45,000 for 500 copies from a master disk to \$300,000 for 10,000 copies.

Upgrades:

Upgrades are provided automatically for a 10% annual fee.

Lotus Corp., Inc.

Major products:

Lotus 1-2-3

Copy protection and liability:

No copy protection, limited liability available.

Pricing and volume requirements: Firms must order at least 50 units and receive more than a 50% discount off of retail price. Discounts increase with volume. User can obtain master disk to

make copies or opt for individual packages.

Upgrades: Same price for any user.

Cosmos, Inc.

Major products:

Revision data base

Copy protection and liability:

Revision is not copy protected, limited liability available.

Pricing and volume requirements: The cost is \$500,000 for an unlimited license for the single-user version, \$75,000 for the network version.

Upgrades:

\$5,000 unlimited upgrading for both versions.

Software Publishing Corp.

Major products:

PFS series, PFS:Professional series, Harvard word

Copy protection and liability:

No copy protection, limited liability available.

Pricing and volume requirements: Site license available for \$75,000 for a single PFS product and \$100,000 for a single Harvard product.

Upgrades:

Upgrades of 10 or more available for a 40% discount.

COMPUTER INDUSTRY

INDUSTRY NOTES

Concord Data divides into two firms

Concord Data Systems, Inc. last week divided its local-area network (LAN) and data communications divisions into two separate companies.

The LAN company was renamed Concord Communications, Inc., while the modems business retained the current name.

Both companies will continue to be headquartered in Marlboro, Mass.

The split will allow better allocation of resources and a more straightforward description of Concord's business to the financial community, according to Concord Communications Marketing Vice-President Mike Zalk.

The **DMW Group, Inc.** announced that it will merge with New York-based Commercial Software, Inc. to form DMW Commercial Systems, Inc.

The Ann Arbor, Mich.-based DMW, best known as a telecommunications consulting firm, also operates a DMW Software unit that will mesh with Commercial Software's network management software development. DMW Chairman Dixon Doll will be chairman of the new company, also located in Ann Arbor.

Burroughs Corp.'s Memorex Media Products Group changed its name to **Memorex Computer Supplies Group** to reflect the company's diversification away from magnetic storage media. Edward

Biechschmidt, former president of Burroughs' Business Forms Division, will head the unit.

Novell, Inc. announced that sales and profits more than doubled during the third quarter ended July 26. The Orem, Utah, local-area network vendor reported net income of \$2.6 million, or 23 cents per share, on revenue of \$22.7 million. Sales advanced 41% from second-quarter levels.

Televideo Systems, Inc. reported a loss of \$689,000, or 2 cents per share, for the third quarter ended Aug. 1. Revenue of \$25 million represented a 20% gain from the previous quarter but was roughly flat compared with year-earlier sales of \$16.9 million.

The Sunrayne, Calif., terminal and microcomputer vendor lost \$10.6 million, or 26 cents per share, in the third quarter of 1985.

It took the Northern California Council of the American Electronics Association (AEA) to pair up **Silicon Valley executives Paal Ely and William Krause** again.

Ely and Krause are the chief executive officers for aborted merger partners Convergent Technologies, Inc. and 3Com Corp., respectively.

Although Convergent has had its share of problems since the merger fell through in March, Ely will serve as next year's chairman of the AEA council, and Krause will be its vice-chairman.

federal cutbacks in defense spending, say Burroughs may not have an easy time divesting the group.

"It's a very good operation, but with the defense budget changing, people may have cooled to the prospect of a defense-related acquisition," noted Michael Geran of E. F. Hutton & Co. "It's a difficult, but doable" deal.

The Aerospace & Marine Group, which employs 9,500, projects revenue of \$750 million for the fiscal year ending March 31, 1987, compared with \$700 million in fiscal 1986, the Burroughs spokesman said. Sperry does not break out the group's profitability, but the unit is in the black, the spokesman added.

The Sperry division was the second defense-related unit of a high-tech company to be purchased by the block-buster **Gould, Inc.** disclosed plans to sell its defense systems business, which recorded \$400 million in sales in 1985. The avionics and military communications unit employs 5,000 people.

Burroughs will not entertain official bids until it chooses an investment banker, the spokesman said.

The company, which expects to conclude its acquisition of Sperry at a special shareholders meeting Sept. 16, said the final decision on whether to sell the group will depend on buyer interest and the price offered.

Burroughs expects to diversify Sperry's Aerospace & Marine unit by the year's end, a company spokesman said.

Sperry group goes on block

From page 114

ing Sperry after Burroughs began its hostile takeover last May. Honeywell, according to the documents, offered \$700 million in cash for the Aerospace & Marine Group.

"If you look at Honeywell's business, particularly revenues outside of the computer industry, you see a well-positioned military group. The Sperry unit would complement it," said Charles Varga of the Cerberus Group, a Frenchtown, N.J., market research firm specializing in mergers and takeovers. "I wouldn't rule them out."

A Honeywell spokeswoman said the firm does not comment on speculation.

Analysts contend that the Aerospace & Marine Group was Sperry's most sellable asset.

Other offers to acquire the group are expected to come from a cadre of Department of Defense contractors, including Boeing Co., Ford Motor Co., Litton Industries, Inc., Lockheed Corp. and General Motors Corp., which is still said to have cash to spare after its 1985 purchase of Hughes Aircraft Co.

Although a Burroughs spokesman characterized interest in Sperry's Aerospace & Marine group as "intense," some analysts, citing possible

federal cutbacks in defense spending, say Burroughs may not have an easy time divesting the group.

"It's a very good operation, but with the defense budget changing, people may have cooled to the prospect of a defense-related acquisition," noted Michael Geran of E. F. Hutton & Co. "It's a difficult, but doable" deal.

The Aerospace & Marine Group, which employs 9,500, projects revenue of \$750 million for the fiscal year ending March 31, 1987, compared with \$700 million in fiscal 1986, the Burroughs spokesman said. Sperry does not break out the group's profitability, but the unit is in the black, the spokesman added.

The Sperry division was the second defense-related unit of a high-tech company to be purchased by the block-buster **Gould, Inc.** disclosed plans to sell its defense systems business, which recorded \$400 million in sales in 1985. The avionics and military communications unit employs 5,000 people.

Burroughs will not entertain official bids until it chooses an investment banker, the spokesman said.

The company, which expects to conclude its acquisition of Sperry at a special shareholders meeting Sept. 16, said the final decision on whether to sell the group will depend on buyer interest and the price offered.

Burroughs expects to diversify Sperry's Aerospace & Marine unit by the year's end, a company spokesman said.

HP stock performance rests on Spectrum market results



ACTIVE ISSUES

Kathy Portous

Although Hewlett-Packard Co.'s Spectrum computer architecture has generated enthusiastic earnings expectations, some analysts are still lukewarm about the company's stock.

Such analysts say that HP (HWP) — 44% remains vulnerable to market economic conditions particularly because of the company's business and that, until more of the company's profitability shifts to its computer business, corporate earnings growth may be limited.

According to Peter Rogers, computer analyst with Mahon, Nugent & Co., about half of HP's pretax profits next year will come from its instrument business, which is driven almost wholly by the economy.

"The stock is vulnerable now because there is no near-term earnings support, and we have yet to receive direct reliable feedback from the customer base on the new Spectrum machines," Rogers says. The first announced Spectrum product, the HP 3000 Series 930, is scheduled for delivery around the end of the year.

"Next year Hewlett-Packard's earnings will benefit from a new computer product cycle," says Gordon Casey, vice-president with Merrill Lynch, Pierce, Fenner & Smith, Inc., "but out of the instrument business, there is no sign of a turnaround." Casey says that at current price levels, the stock is a little rich. He estimates HP will earn \$2.40 in its next fiscal year ending Oct. 31, 1987.

Because of the magnitude of HP's new computer architecture, officially called HP Precision Architecture, the company's potential earnings momentum has been com-

Portous is president of Strand Research Associates, a Centerville, Mass.-based company that provides customized research services for financial and high-tech firms.

pared with Digital Equipment Corp.'s situation. By adopting strict cost-cutting measures, DEC was able to high leverage its new products; consequently, it continues defying market conditions.

But Peter E. Heymann, analyst with Drexel Burnham Lambert, says, "You cannot necessarily make the same case with what Spectrum will do for HP. At this point, I'm only fearful that people's expectations about how quickly these products get out in the world could be ahead of reality." Heymann estimates the company will earn \$2.40 to \$2.60 per share in fiscal 1987.

Owing to the pent-up demand of HP 3000 users, all Spectrum products produced in 1987 will be shipped, according to analysts.

The next 90 days?

Rogers of Mahon, Nugent anticipates "HP could be the next DEC if the earnings from computer shipments come through and if HP gets some help from the economy." He adds, "I'm not as convinced that the economic outlook is as dire as our perceptions now indicate." As a result, Rogers estimates the company will earn \$2.65 per share in 1987.

Analysts agree that HP's computer-aided engineering business is strategically critical but that its current offerings are playing catch-up to the CAE products of companies such as Mentor Graphics, Inc. and Datalysis Systems Corp.

Casey says HP's strength in CAE is its ability to provide integrated solutions, although the day when this would be a key selling point has not yet arrived.

Despite differing expectations about Spectrum and the economy, which also mean differing opinions as to what value should be accorded HP's stock, analysts tend to agree that the company qualifies as a core technology holding.

"Given its quality, its increased competitiveness in computer markets and its ongoing dominant position in the instrument business," Rogers says, "HP is one of those stocks you can buy for two to three years out."

Corvus drops auditor, causing dispute

By Maura McNamee

SAN JOSE, Calif. — Corvus Systems, Inc., the computer networking company that recently introduced the first Intel Corp. 80386-based micro, is embroiled in a dispute with its former auditing firm over Corvus's decision to drop its services.

Corvus recently replaced Big Eight accounting firm Coopers & Lybrand with Deloitte, Haskins & Sells. Coopers & Lybrand, in a letter to the Securities and Exchange Commission (SEC), claimed that Corvus executives threatened to fire the accounting firm if it released a negative opinion on the firm's financial status.

Coopers reportedly planned to issue a "going concern" qualified opinion on Corvus, a rating which indicates the auditor had some doubts about Corvus's survival. For the fiscal year ended May 31, Corvus reported a loss of \$32.6 million.

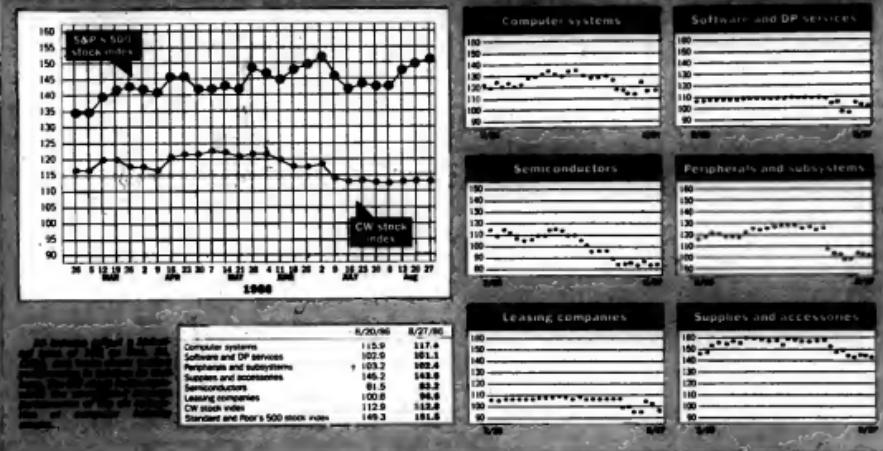
Corvus Executive Vice-President Joseph Rooney told *Computerworld* that the firm's decision to fire Coopers & Lybrand was based only on "quality and timeliness of service."

According to Rooney, Corvus has told Coopers & Lybrand that its letter to the SEC was inappropriate and was "potentially damaging to Corvus and its reputation."

COMPUTER INDUSTRY

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INSTANT ANALYSIS

"It's a computer company masquerading as a bank."
— Michael Gross, E. F. Hutton & Co., on Digital Equipment Corp.'s balance sheet, which includes \$1.2 billion in cash

DETROIT — Burroughs Corp., moving to defray the \$2.9 billion it must raise to fund its \$4.5 billion acquisition of Sperry Corp., last week formally disclosed its intent to divest Sperry's Aerospace & Marine Group. Analysts are keeping a watchful eye on Honeywell, Inc. as a potential buyer.

Burroughs said the decision to divest the business unit, which manufactures primarily flight control systems and marine-related instruments for military and commercial customers, would leave the combined corporation with what it considers its two core businesses — commercial information systems and defense systems.

Honeywell, according to documents filed with the Securities and Exchange Commission, expressed interest in acquiring

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By Alan Alper

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Tandon splits into two units

Ailing firm to focus on PC-compatible market

By Murray McLauchlan

CHATSWORTH, Calif. — In an attempt to increase its efforts in the personal computer market, while decreasing emphasis on its ailing disk drive business, Tandon Corp. last week reorganized into two independent business units.

Under the plan, one division will be responsible for developing, manufacturing and marketing IBM-compatible personal computers, while the other will be responsible for selling Tandon disk drives in new retail channels.

The company also announced 50 layoffs from its corporate and administrative areas, its second work force reduction within a month, and 10% across-the-board payroll reductions.

More than 225 employees were laid off and 270 furloughed when Tandon announced it was closing manufacturing op-

erations at its Microtek Storage subsidiary in San Jose, Calif., and moving manufacturing to Singapore [CW, Aug. 11]. Tandon's work force now stands at about 1,000, compared with 2,450 in March 1984.

Analysts said the two moves could provide a much-needed boost for Tandon, which is hoping to compete for a portion of the lower priced compatible market after losing \$17.5 million in the first three quarters this year. Tandon lost \$52.2 million or \$214 million in sales during the same period in 1985.

"If you look at the market in general terms, there's always room for a lower priced brand name," analyst James Stone of Sheraton Lehman Brothers, Inc. said. "You only have one low-price competitor with any recognition, and that's Leading Edge Computer Products, Inc. Maybe there's room for another."

According to Stone, Tandon has a safety net of existing OEM disk drive customers from which to build its PC business. "By

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Sperry group goes on block

By Alan Alper

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INDUSTRY INSIGHT

Clinton Wilder

Who sets the standards?

For five years, the phrase "industry standard IBM Personal Computer" has been the watchword of the entire microcomputer industry. But five years is an awfully long time in that industry. With micros poised to enter the Intel Corp. 80386 era, the evolution of the market has brought "industry standards" in an entirely different light.

The Big Blue Miracle of Boca Raton, Fla., clearly established the business microcomputer standard of the early 1980s. That standard was labeled *de facto*, meaning nowhere was it written that users, software developers and peripherals vendors had to live their computer lives around DOS. The market simply saw it — with a large push from IBM, the greatest marketing group the industry has ever seen.

Just as the Amherst, N.Y., brain trust has given the late Phil Estridge's Systems Division enough slack to configure an IBM product with outside vendors' components, the product itself gave the market enough room to grow up around the industry standard of IBM compatibility. But the salient point, which IBM may have overlooked, is that IBM alone did not set that standard; market direction did.

Now roll the tape forward to this month, with one 80386-based micro already launched by Corvus Systems, Inc. and the expected blockbuster from Compaq Computer Corp. due next week.

"Our research shows that the risk of having an 80386 machine before IBM is

See WHO page 92

Wilder is Computerworld's senior editor, computer industry.

Retailer tries to breathe new life into Columbia Data Products

Plans to form users group, revive AT clone

By Niniany Buba Magaña

FOREST CITY, Fla. — The or-phased users of Columbia Data Products, Inc. IBM-compatible personal computers may have found a new father — or godfather, that is.

Godfather's Used Computer Syndicate, a \$2 million-a-year mail order and retail computer store, has purchased the assets of the defunct Columbia, Md.-based personal computer manufacturer for an undisclosed amount and plans to form the Columbia Owners Group (COG) for an estimated 70,000 users.

As any godfather would, Godfa-

ther's president and chief executive officer, Alan Welsh, says he is set on protecting Columbia users.

Columbia, one of the first manufacturers of IBM-compatible personal computers, filed for bankruptcy protection from its creditors in May 1985 and closed shop last November after an unsuccessful search for a buyer.

The attempted resurrection of Columbia should be good news to Columbia customers, whose ranks include users in the military, the Internal Revenue Service, the Environmental Protection Agency and Honeywell, Inc.

"I'm all for it," says Commander Roger New, U.S. Navy weapons officer at the Naval Air Station in Fallon, Nev. "I'll be able to talk to other Co-

lumbia users to find out how they use their machines. It would be wonderful to talk to someone else instead of feeling that I bought a loser — and now I know I didn't. I recommended the machine before the company went out."

Aside from forming COG, Godfather's plans to market 900 leftover Columbia IBM Personal Computer-compatible machines and manufacture the firm's previously designed but undelivered IBM PC AT-compatible, according to Welsh. He adds that the retailer will immediately offer software upgrades of read-only memory BIOS and DOS to Columbia micro users.

The Columbia purchase encompassed the bankrupt firm's name, technology and "four or five truck-

loads" of documentation, engineering reports and unsold machines, according to Welsh.

But not all users are confident that Godfather's will be able to fully support the product line. David Sorga, a software engineer for Philadelphia-based Computer Command and Control Co., says, "I'm trying to get a machine upgrade without complete success. Godfather's wanted to charge me for a copy of DOS I don't actually need. It could just be a lack of familiarity with all the details of Columbia systems. Most units aren't as archaic as mine."

Godfather's plans to upgrade the 900 unsold Columbia micros with either 10M-byte or 20M-byte hard drives, install software and sell the

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WHEN NCR WANTED TO INCREASE PROGRAMMER PRODUCTIVITY, THEY FOUND THAT DLC SPEAKS THEIR LANGUAGE.

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